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The American

GAS LIGHT JOURNAL.

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(ILLUSTRATED.)

DEVOTED TO THE INTERESTS OF

ILLUMINATION, HEATING, MECHANICAL, CHEMICAL

AND

GENERAL SCIENCE.

VOLUME LXXXIII.

(FORTY-EIGHTH YEAR.)

FROM JULY 1 TO DECEMBER 31, 1905.

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REDMANKENNY, N.Y.

PUBLISHING OFFICE No. 42 PINE STREET

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[NOTICE.]

Thirteenth Annual Meeting, Pacific Coast Gas Association.

PACIFIC COAST GAS ASSOCIATION,
OFFICE OF THE SECRETARY,
SAN FRANCISCO, June 16, 1905.

The Thirteenth Annual Meeting of the Pacific Coast Gas Association will be held in the Assembly Hall of Mechanics' Institute, No. 31 Post street, San Francisco, Cal., July 18th, 19th and 20th. On the 17th the annual meeting of the Directors will be held at 8 P.M., Room 617 Rialto Building. All members are invited to attend the session of th, Board. On Tuesday and Wednesday regular sessions will be held from 10 A.M. to 12:30 P.M., and from 1:30 to 5:30 P.M. of each day.

At 6:45 P.M. of Wednesday the usual banquet will be held in Delmonico's restaurant.

On Thursday the annual excursion with luncheon to members, their families and friends, is arranged for. Headquarters for members will be on the sixth floor of the Rialto Building.

The following papers will be presented:

"Commercialism at Gas Association Conventions," by Mr. Lucius S. Bigelow.

"A Gas Man's Catechism," by Mr. John A. Britton.

"The Public Utility Corporation and the Municipality—Their Legal, Equitable and Economic Relations," by Mr. H. C. Brown.

"Wrinkles," Mr. Geo. S. Colquhoun, Editor.

A paper by Mr. H. L. Doherty; title to be announced.

"Question Box." Mr. E. C. Jones, Editor.

"Something About the Physics and Chemistry of Gas," by Mr. F. C. Jones.

"Gas Arcs," by Mr. W. M. Kapus.

"Association History," by Mr. Geo. P. Low.

"Utilization of Gas Engines in Connection with Long Distance Electric Transmission," by Mr. John Martin.

"Notes Regarding Gas Tars," by Mr. P. W. Prutzman.

"The Compression and Transmission of Illuminating Gas," by Mr. E. A. Rix.

"Experiences," Mr. R. P. Valentine, Editor.

"Suggestions for Increasing Gas Consumption," by Mr. J. W. Wrenn.

A paper by Mr. G. C. Holberton; title to be announced.

There will be an unusually interesting display of novelties in gas appliances during the session, special attention being given to exhibition of articles of merit and originality. Applications for membership will be received until Tuesday, July 18th, 1905.

In increase in membership, in number of interesting papers, the 13th, annual meeting promises to surpass all others, but to insure this, attendance of members is especially required. Make it a banner year in attendance; mix with your fellows; do team work.

Discussion of project for National Association will also be taken up.

In order that adequate arrangements be made for the meeting, it is essential to know in advance the number of members who will attend each of the functions. To that end kindly fill out and mail at once the inclosed postal, indicating by "Yes" or "No" answers to the various questions. Yours in the faith, JOHN A. BRITTON, Secretary.

[OFFICIAL NOTICE.]

Wrinkle Department, Western Gas Association.

OFFICE OF EDITOR, WRINKLE DEPARTMENT,
WESTERN GAS ASSOCIATION,
182 WISCONSIN STREET, MILWAUKEE, WIS.,
June 27th, 1905.

To the Members of the Western Gas Association: Your early attention and assistance are earnestly solicited in connection with the above Department for 1906. We are now ready to receive contributions and any device, plan, scheme, wrinkle, suggestion, formula or new method will be warmly welcomed. A full description, with sketch or photo, should accompany each contribution. Give us your help to make the 1906 Wrinkle Department a success. Thanking you in advance for your kind assistance, I remain, Yours truly, B. MCADAM, Editor.

[OFFICIAL NOTICE.]

Respecting the Official Work of the American Gas Light Association.

JUL 8 1905
DEPOSIT

AMERICAN GAS LIGHT ASSOCIATION,
SECRETARY'S OFFICE,
530 Broadway, N. Y.,

To the Members American Gas Light Association: As there seems to be some misunderstanding respecting the standing of the official management of the Association, members will please note that the un-

dersigned is the Secretary of the Association, and that Mr. A. E. Forstall is carrying forward the work of the Practical Class. All correspondence in connection with the Practical Class should therefore be addressed to Mr. A. E. Forstall, 58 William street, and all other matter pertaining to the Association to MR. GEORGE G. RAMSDELL, Secretary, at the above address.

[NOTICE.]

Wrinkle Department, Ohio Gas Light Association.

OHIO GAS LIGHT ASSOCIATION,
OFFICE OF THE WRINKLE DEPT.,
719 CITIZENS BUILDING,
CLEVELAND, O., June 13, 1905.

The Wrinkle Department of the Ohio Gas Light Association is now ready to receive contributions for the 1906 collection, and a sketch or description of all devices, formulæ and methods of accomplishing objects pertaining to the gas business, is respectfully solicited.

Please send a written explanation, accompanied by any sketch, photograph or drawing, to the above address, or a description alone will suffice.

Hoping to receive prompt compliance, Yours very truly,
W. E. STEINWEDELL, Editor.

BRIEFLY TOLD.

NOTES.—

MR. JAMES R. SHEFFIELD, of New York city, who was named by Governor Higgins as a member of the New York State Lighting Commission, has declined to accept the appointment. Mr. Sheffield's avowed reasons for refusing to serve on the commission relate to "business engagements and legal connections which he could not afford to sever."

Mr. FRANK D. MOSES, of Trenton, N. J., informs us that the new coal gas works at Granite City, Mo., are in full operation. The contract awarded to Mr. Moses covered everything from the outlet of the hydraulic main to the consumer's meter, including washers, scrubbers, purifiers, station meter, storage holder and street mains. Of the latter 8 miles were placed. The capacity of the works is 250,000 cubic feet per day, and the plant is under the direction of Mr. Arthur Finnegan, who was for a long time in the service of the Laclede Gas Light Company, of St. Louis.

MR. JAMES WATSON STUART, Secretary and Treasurer of the Conemaugh (Pa.) Gas Company, died at his home in Shadyside (a suburb of Pittsburgh, Pa.), the evening of June 21st.

THE affairs of the Quincy, Ills., local lighting companies seem to have reached a final settlement. The owners of the Quincy Gas and Electric Company have certified to the Secretary of State that the new name of the concern is the Quincy Gas, Electric and Heating Company, that the capital stock has been increased to $2,000,000, and that the number of Directors is 7 instead 5.

MR. J. M. KLINGELSMITH has resigned the position of President of the Mystic (Conn.) Electric and Gas Light Company. We also understand that he has resigned as Treasurer of the Westerly (R. I.) Gas and Electric Light Company.

MR. MARTIN E. JENSEN has resigned the Treasurership of the gas and electric departments of the city of Norwich, Conn.

MR. J. S. DIXON has resigned the Superintendency of the gas division of the properties of the Utica (N. Y.) Gas and Electric Company.

A CORRESPONDENT in Boston, Mass., writing under date of June 27th, incloses the following: "More than 20 men, connected at one time or another with Boston gas affairs, assembled at a dinner last night at the Lenox, to express their appreciation of ex-Treasurer Frederic Tudor, and to wish him good luck in his new business. To many of them it was a memorable occasion, as it marked the breaking of associations, dating back to 1896. Mr. R. M. Burnett, once Receiver for the New England Gas and Coke Company, presented Mr. Tudor with a large silver loving cup, on which was engraved, 'Presented to Frederic Tudor by his former associates in the Gas Companies, as a token of personal esteem. Boston, Mass., June 28, 1905.' Among others present were Messrs. W. M. Butler, Robert Grant, J. A. Gould, W. H. Gardiner, Jr., W. B. Nichols, J. P. Gardiner, Charles C. Marvel, George M. Stearns and E. B. Page. While Mr. Tudor retains the Secretaryship of the Massachusetts Gas Companies, he has resigned all his other active positions, to rejoin his former associate, Mr. Henry M. Whitney, in a new enterprise."

[OFFICIAL REPORT.—REVISED BY THE SECRETARY.—CONTINUED FROM VOL. LXXXII., PAGE 1010.]

TWENTY-EIGHTH ANNUAL MEETING, WESTERN GAS ASSOCIATION.

HELD AT CHICAGO, ILLS., IN THE AUDITORIUM HOTEL, MAY 17, 18 AND 19.

FIRST DAY—AFTERNOON SESSION.

BUDGET FROM THE WRINKLE DEPARTMENT.—*Continued from Vol. LXXXII., Page* 1010.

DISTRIBUTION.

No. 1.—"*Method of Determining Relative Quantity of Flow in the Various Branches of a Distribution System.*—The attached cut shows the general lay of the city New Orleans, La., our main distributing lines, the high pressure lines and the high pressure stations.

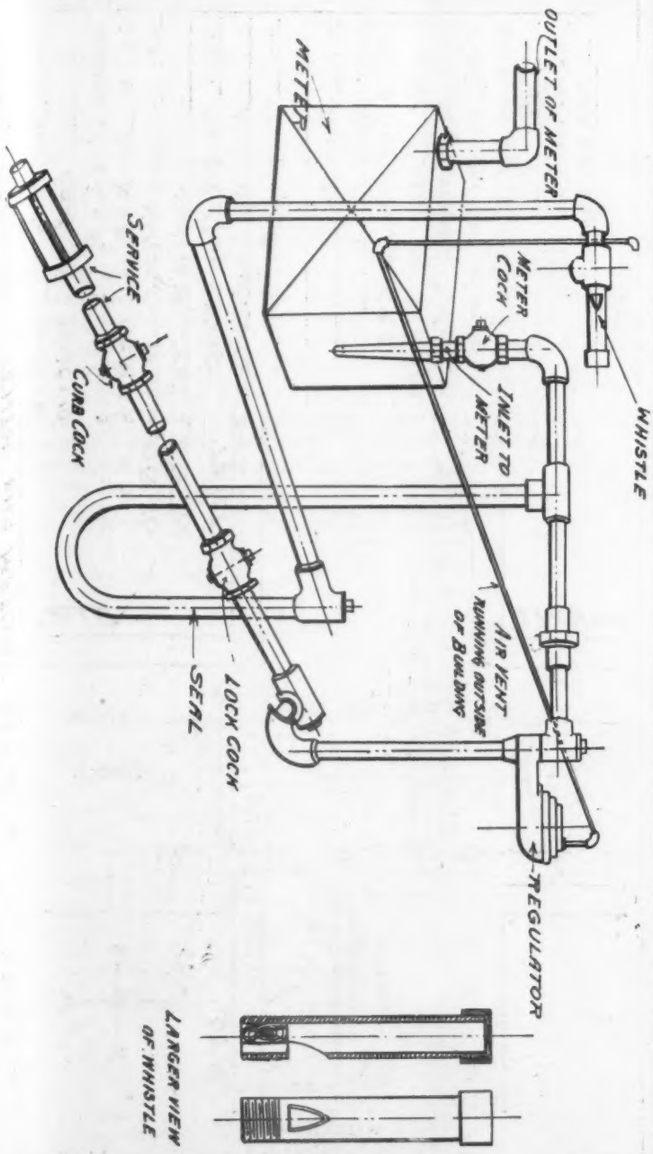
"The problem which I was forced to solve was the territory double lined between Stations *A*, *D* and *H*, referring to Fig. 1. At a point inclosed in a circle are mains which can be supplied from Station *A*, which is the works, *B* which is a holder, or *D* which is a high pressure governor. Desiring to extend our re-enforcing lines into the territory which is double lined I naturally wanted get to in the shortest run of

Wrinkle No. 1.

pipe, but on the other hand I wanted to draw the supply of gas from the holder at the works rather than from a station supplied by the high pressure system for obvious reasons. Referring to Fig. 2: I had gas stoppers inserted at *A*, *B* and *C*. By expanding the stoppers at either place and taking pressures on both sides of the stopper, I was able to determine just the value of the flow of gas coming from these three different directions. Having finally demonstrated the fact that there was an ample flow coming from the main plant, it was a simple question to lay out a re-enforcing line to go into the territory suffering from low pressure."—THOS. D. MILLER, New Orleans, La.

No. 2.—"*Safety Whistle on High Pressure Service Connections.*—At the point marked *W* a whistle is placed so that, in case the governor is not working and allowing the gas to force the oil out of the seal, the whistle will commence blowing and continue blowing until conditions are remedied. This whistle is made out of a short piece of ¼-inch pipe, with a cap on one end and a notch and wooden plug at the other. This is an additional safeguard against accident and costs very little."—W. S. REGER, Laclede Gas Light Company, St. Louis.

No. 3.—"*Portable Air Compressor.*—Accompanying is a photograph of the apparatus used by the Laclede Gas Light Company, of St. Louis, for testing both high and low pressure mains. It consists of a Fairbanks-Morse, 6-horse power vertical gasoline engine, a 6 by 6 Star air compressor, made by the St. Louis Steam Engine Company, and a 24-inch by 5-inch air receiver. Mounted on a truck it is easily

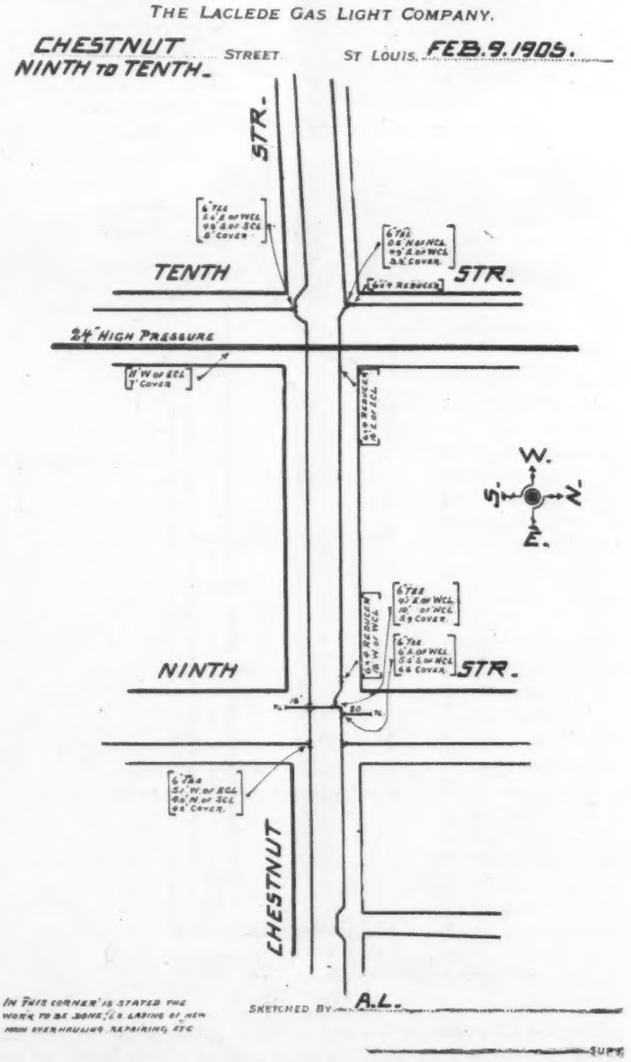


Wrinkle No. 2

Wrinkle No. 3.

moved along the line, or from one job to another. This feature makes the use of the apparatus practical for caulking joints as well as testing. The engine will furnish 125 pounds pressure at a very little cost, as the wagon is not shifted often on a long run of pipe, and can be run by a 'handy' man. The total cost of an outfit of this kind, without a wagon, runs about $550.—J. D. VON MAUR, Laclede Gas Light Company, St. Louis, Mo.

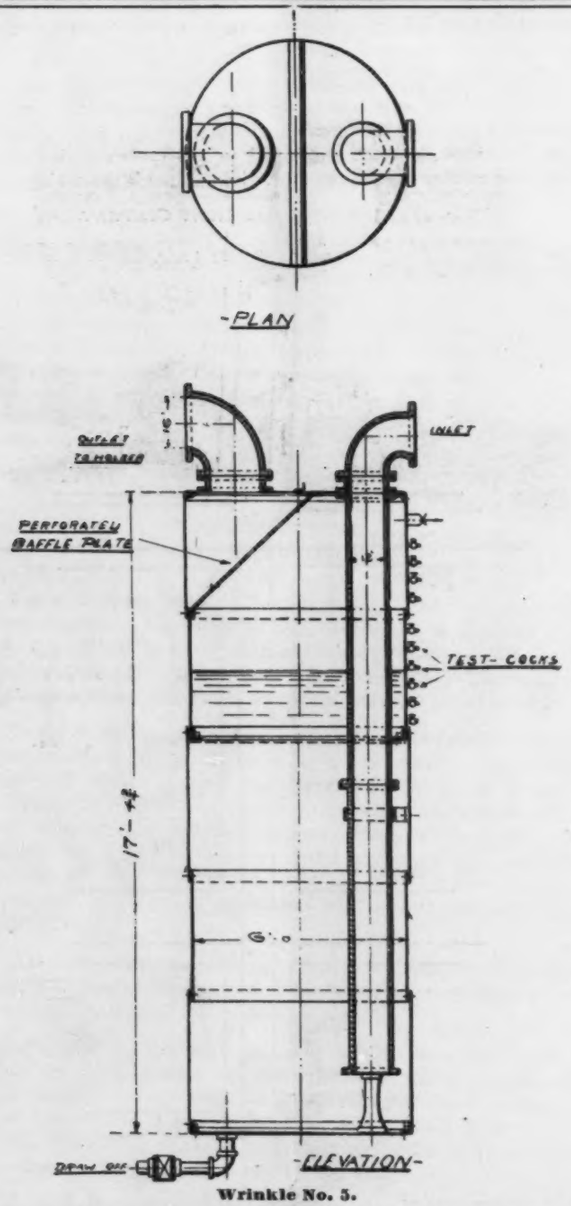
No. 4.—"*Sketches with Main Orders.*—Whenever any main work is to be executed an order is issued giving the foreman his instructions. To make it easier for the foreman, and to give him a more intelligent idea of his work, a sketch is attached to this order showing the actual conditions as they exist at the time, giving him all the mains and loca-



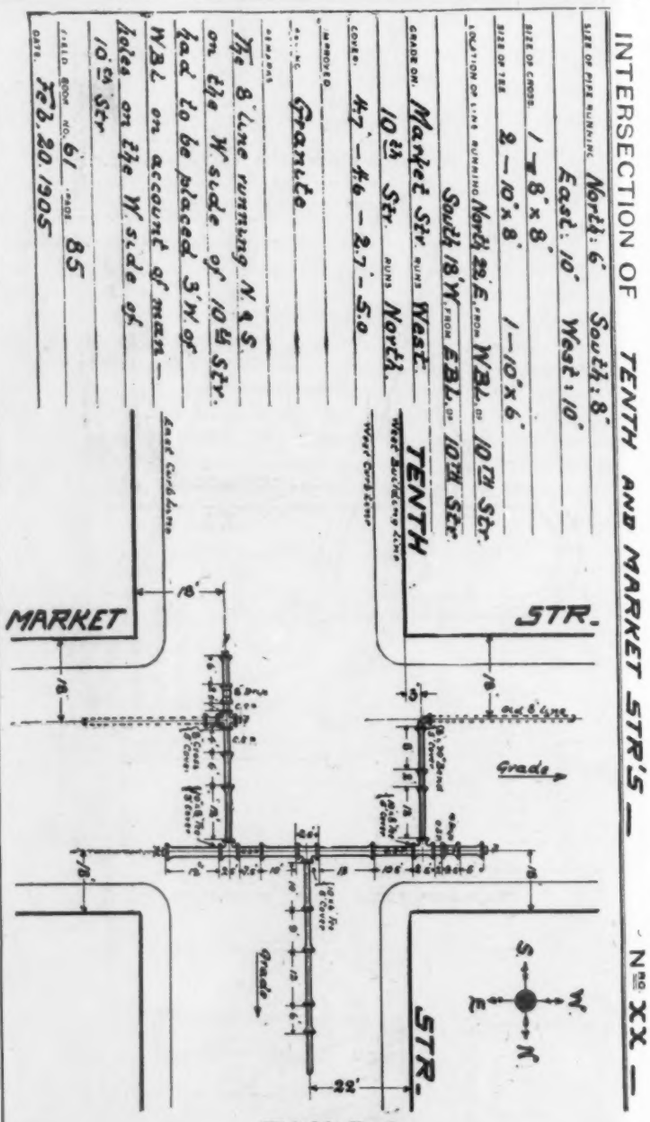
Wrinkle No. 4.

tions on the street to be worked on, and also all mains crossing this street. As many details are shown as possible without making the sketch too complicated. It has been found to be very useful and a great saver in time, money and explanations."—G. S. HASSENBRUCH, Laclede Gas Light Company, St. Louis, Mo.

No. 5.—"*A High Pressure Seal.*—To prevent trouble on the high pressure lines, due to excessive pressure, a seal is connected to the outlet of the blower at the central pumping station. The seal shown in sketch is a steel tank 6 feet in diameter and 17 inches by 4½ feet in depth, having at the top two openings, one *A* connecting a 16-inch line from the blower, and the other *B* connecting a 16 inch line to the inlet of the holder. From the opening *A*, a 16-inch pipe extends to within 18 inches of the bottom of the tank, and rests on a substantial support. The tank is filled with water to a point above the bottom of the inlet pipe, so as to cause a water column equaling 5 pounds per square inch pressure. This water is sufficient to resist a pressure of 5 pounds, which is the maximum the lines are designed to carry. Should the pressure exceed 5 pounds the seal will blow and the gas escape through outlet *B* to the holder and be repumped. A baffleplate is placed at an angle of 45° across opening at *B* to prevent foam, caused by the bubbling of escaping gas, to pass through into the pipe. The tank is provided with the necessary connections and fittings for draining."—By the EDITOR.



Wrinkle No. 5.


INTERSECTION OF TENTH AND MARKET STR'S
No. XX
SIZE OF PIPE RUNNING North 6' South 8' East 10' West 10'
SIZE OF CROSS 1-8"x8" 2-10"x8" 1-10"x6"
SIZE OF TEE 2-10"x8" 1-10"x6"
LOCATION OF LINE RUNNING North 22 E. FROM W.B.L. OF 10th Str.
South 18' W. FROM E.B.L. OF 10th Str.
GRADE ON Market Str. RUNS West. 10th Str. RUNS North.
COVER 4'7"-4'6"-2'7"-5'0
MATERIAL Granite
REMARKS The 8" Line running N. & S. on the W. side of 10th Str. had to be placed 3' W. of W.B.L. on account of manholes on the W. side of 10th Str.
FIELD BOOK NO. 61 PAGE 85
DATE Feb. 20 1905
MARKET
TENTH
STR.
STR.
Grade
Grade
22'
N.
S.
E.
W.

Wrinkle No. 6.

No. 6.—"*Intersection Cards.*—It is of great value to the street department to be able to give the foreman of a main gang the exact location of fittings, etc., at intersections of streets. To keep a separate and an up-to-date record of the mains, fittings, etc., at such intersections, a card system was gotten out. The accompanying illustration shows such a card. All locations are given and any special point can be dug up without disturbing any more of the street than is absolutely necessary. The cards are 8 inches by 5 inches, and they are filed alphabetically. Before starting to dig any desired location can be given the foreman."—GEORGE S. HESSENBRUCH, St Louis, Mo.

No. 7.—"*A Pitot Tube and Pipe Bender.*—The Pitot tubes, as illustrated in accompanying sketch, are of ¼-inch pipe, and made by ourselves. We made a tube bending apparatus which enables us to bend a pipe at exactly the same angle, and find that tubes made in this way give consistent results."—E H. EARNSHAW, Cincinnati Gas and Electric Company.

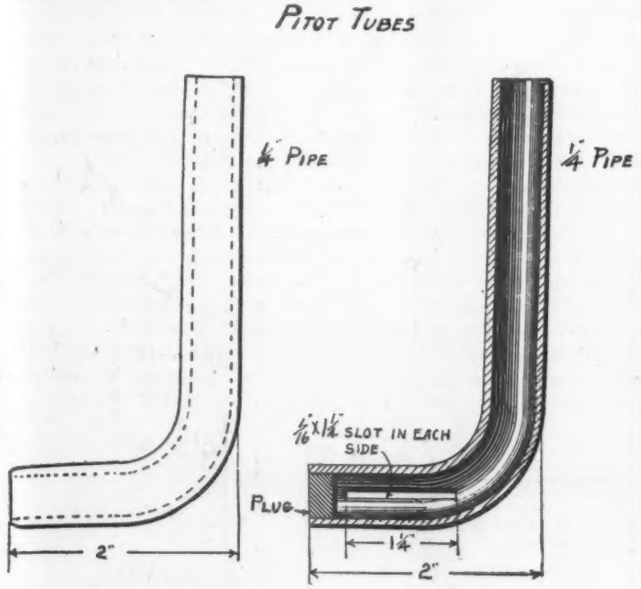
No. 8.—"*Method of Installing a High Pressure Service.*—Those familiar with the distribution of gas under high pressure would perhaps be interested in the following:

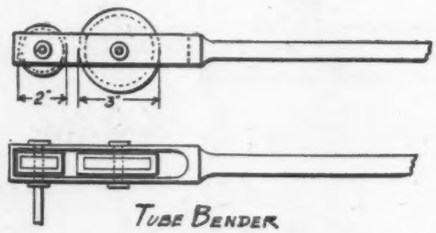
"To install a high pressure service, it has been necessary at the main to use a saddle, a corporation cock and 2 street elbows, raising the service some 8 or 9 inches above the main and making a connection that was more or less weak and one that was apt to break in cold weather. At the house end a complicated arrangement of pipe and fittings was required to properly connect up the governor and seal, and as this usually lay close to the meter considerable room was taken up. This method of connecting was not only unsightly but quite objectionable, particularly so if the service ran directly into the kitchen or living room, as is frequently the case where no basement exists.

"The combination saddle and tee *A* permitting of a shorter and more rigid connection at the main, and the seal *B*, small and compact, because it is made to hold mercury instead of oil, are the only novelties in this wrinkle; but a comparison of the two drawings will show at a glance the superiority and neatness of one over the other. The opening at the top of the tee *A* is for the purpose of inserting a wooden plug so that the gas can be shut off temporarily until the curb cock is reached, when it is within and the plug replaced. In both drawings the services are made to appear as if they extended a foot or more in the basement, but this was done merely to show a little more clearly the position of governor and seal. In practice the whole connection is twisted and crowded into a more compact mass, so that it does not occupy as much room as indicated.

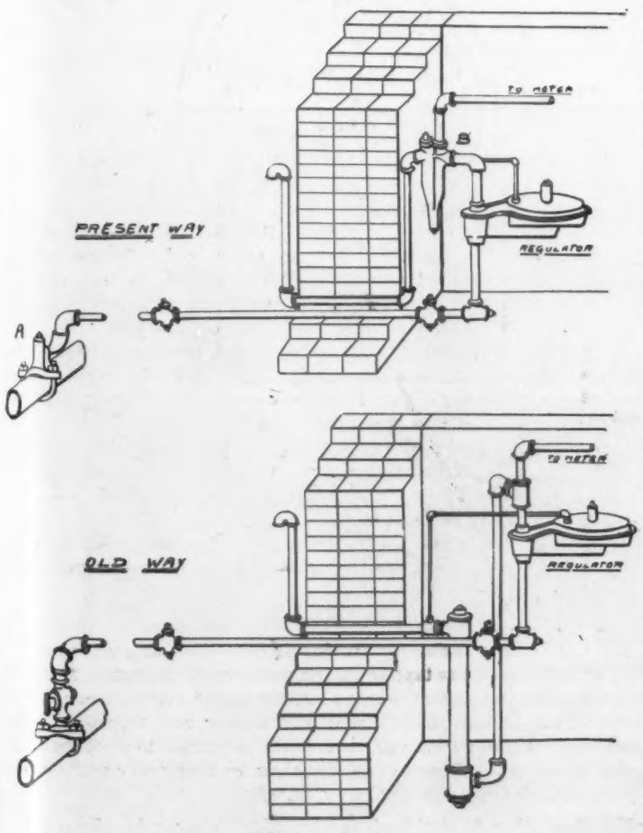
"Both the saddle and tee, I am told, were designed by Mr. Johnson, formerly of Hammond, Ind."—LESTER F. PRICE, North Shore Gas Company, Highland, Ills.

No. 9.—"*Special Split Sleeve.*—Prior to the spring of 1903 service taps in St. Louis were made into the side of the main, and the hole in nearly every case was tapped the same size as the service. The swing joint or street tee and ell was not used on services in St. Louis prior to 1903. We, therefore, have found in our extensive overhauling hundreds of good 1¼-inch services connected into the side of 4-inch mains with 1¼-inch tap. Where we find such service connections it has been our custom to cut the service off, put a split sleeve on the main, cut a new thread on the cut end of the service aud re-connect with a long screw. Where a broken main or a defective tap was found the same

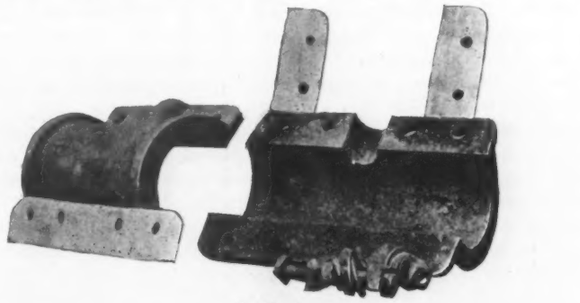




Wrinkle No. 7.

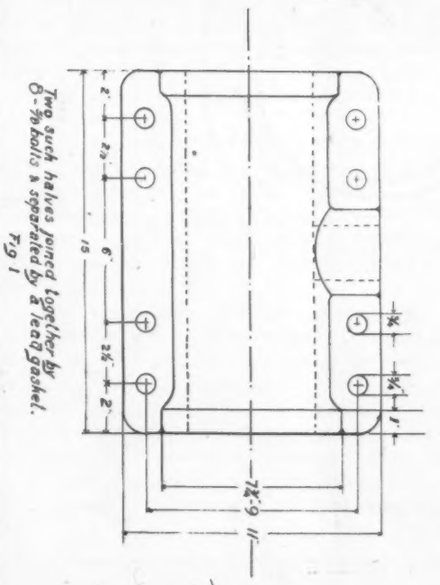


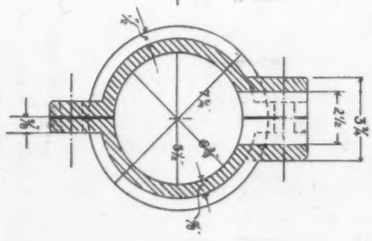
Wrinkle No. 8.

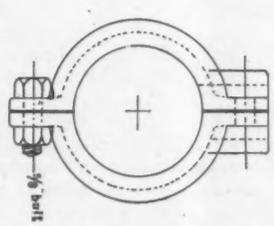


Cut No. 1.

Cut No 2.







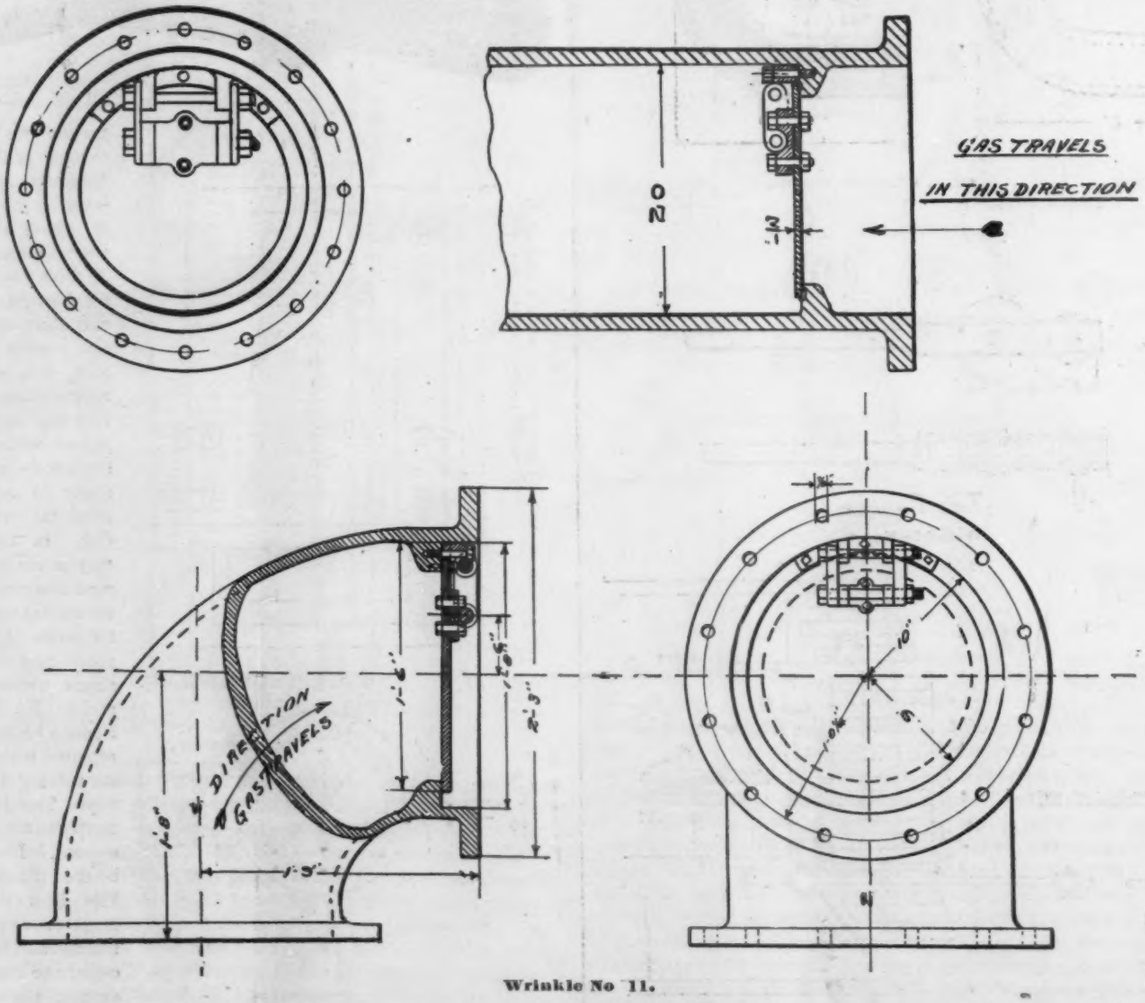
Cut No. 3.

Wrinkle No. 9.

process was gone through with. Aside from the inconvenience to the customer, whose supply we were obliged to cut off from 1 to 2 hours, considerable labor was expended. You can readily see that with this sleeve a broken main at a service tap can be repaired without cutting off the supply in about 15 minutes after the trench is dug. In the same way a main can be strengthened where the tap has been made too large. Cut No. 1 shows part of such a sleeve unassembled, and cut No. 2 shows a 4-inch broken main repaired without disconnecting the service. The joints in the photo are made of cement. Lead may be used if so desired. The boss is made large enough to admit the making of a cement or lead joint around the service pipe. Cut No. 3 shows the details of such a sleeve. The saving in labor in using such a sleeve is considerable. The cost of putting in a sleeve as above described in a dirt street on a 4-inch main, the labor was $1.66, whereas under the same conditions, but using an ordinary 4-inch sleeve tapped to 1¼ inches, necessitating cutting the service and reconnecting service after sleeve is put on main, the labor is $3.27, making a net saving of $1.61."—P. H. GIBBONS, Laclede Gas Light Company, St. Louis, Mo.

No. 10.—"*Folding Main Maps.*—It is of great advantage to be able at all times to tell what mains are on certain streets, and on what side of the street they are located, without having to refer to the regular office records. This is especially true for superintendents and district superintendents. For this purpose an ordinary city map may be adopted and be cut into equal sections, mounting all these sections on a linen back so that they can be folded together, and binding it in a heavy protecting cover. The mains are inserted in the drafting room and the map is posted once every two weeks. These maps are gotten out for the gas department as well as the electric department, and are of size that they can be put in one's coat pocket."—GEORGE S. HESSENBRUCH, Laclede Gas Light Company, St. Louis.

No. 11.—"*Check Valve for Use on High Pressure Blower.*—This check valve elbow was designed to preclude the possibility of the pressure in the mains backing up into and reversing the blower and blowing seal, as actually occurred. The valve plate hangs on a line hanger which is bolted to the face of the special by means of a supplemental suspension link, which allows the valve plate to assume a parallel position, and under all conditions make a tight fit against valve seat. These are used at the outlet of the blowers pumping into the 5-pound, high-pressure system at St. Louis. It is a good general rule to use check valves on the outlets of all compressors."—J. D. VON MAUR, Laclede Gas Light Company, St. Louis, Mo.



Wrinkle No 11.

No. 12.—"*Simple Iron Connections for Illuminating and Fuel Gas Meters.*—The accompanying sketch shows a desirable and simple method of iron connections for gas meters used by the Laclede Gas Light Company, of St. Louis, Mo.

"This method has been found exceedingly satisfactory. It is very accessible and the meters can be taken off and put on with very little trouble, and without at any time disturbing any of the pipe which remains in the house. At the connection of the service there is a tee plugged on one end which allows an easy access for wiring the services or for using alcohol during the winter time. From this connection there is a riser which leads to the header through a tee. This tee is also plugged on one end for accessibility and cleaning purposes. The inlet of the meter itself is connected to the header by means of a male thread, side outlet tee and two regular street ells, thus permitting considerable flexibility in both directions. The meter cock is a lock cock and there are also locks over both meter unions, in this way preventing anybody from closing or opening this cock at will or disconnecting the meter. The outlet of the meter is connected by means of an ell and tee to the house riser. This house riser extends down about 8 or 10 inches below the connection of the tee, forming in this way a drip for any moisture or other matter which may form in the pipe and drip down, preventing it from getting inside of the meter itself for a much longer time than by the ordinary method.

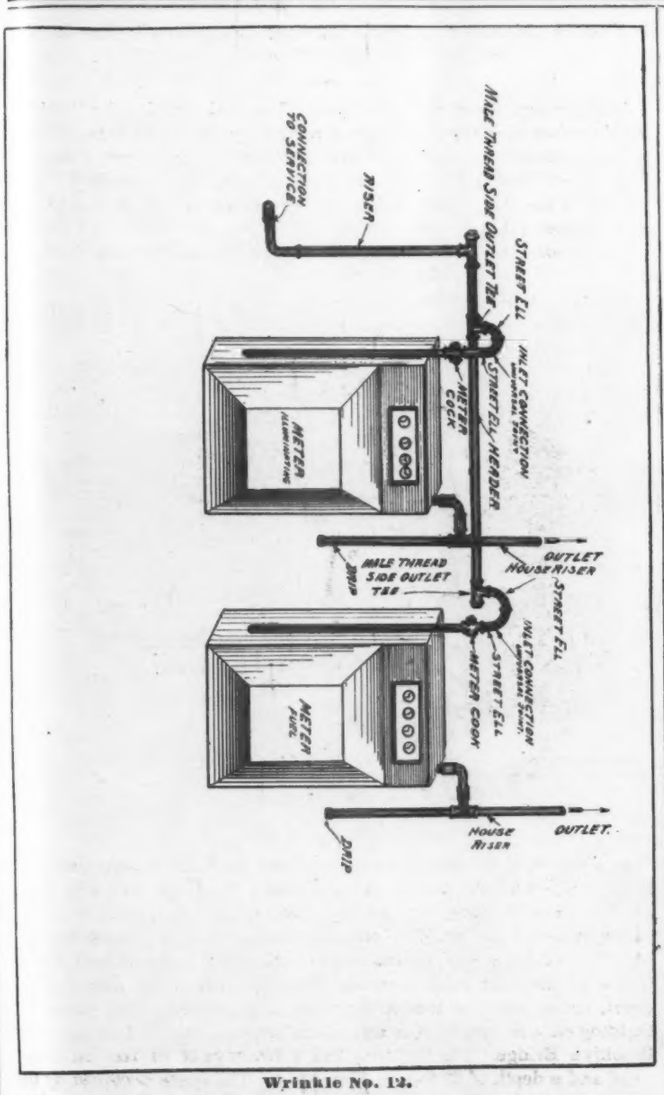
"The arrangement of connecting meters in this manner also has the advantage of permitting the extension of the header and connecting as many meters to this header and piping as are wanted without having the meters bunched, or having an unsightly arrangement where the meters are installed, and at the same time allowing the removal of any one meter without disturbing the remainder.

"The Laclede Gas Light Company is using this arrangement of installing meters throughout, and is rapidly changing all the old lead meter connections to this style."—W. S. REGER, Laclede Gas Light Company, St. Louis, Mo.

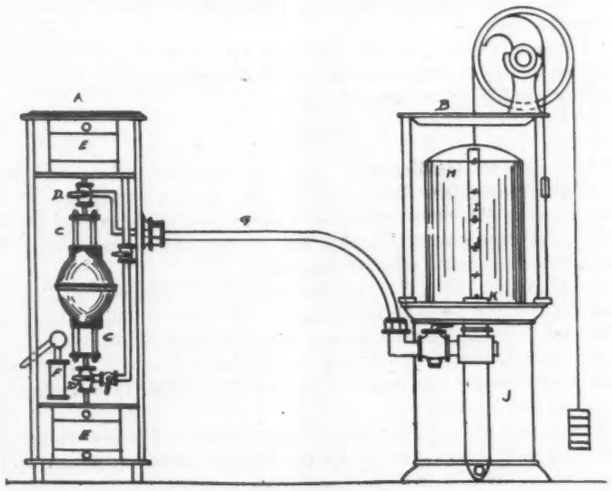
METER WORK.

No. 1.—"*Oiling Device for Station Meters.*—The diagram shows a very complete method of oiling station meters used at Station A works of the Laclede Gas Light Company: *A* represents station meters to be oiled; *B*, a 20-gallon oil tank supported among roof trusses; *C*, feed pipes supplying oil cups *D*; *D*, oil cups are connected to shaft bearings inside of meters; *E*, stopcocks on feed pipes for filling oil cups."—J. O. JONES, Laclede Gas Light Company, St. Louis.

No. 2.—"*How to Calibrate a Gas Meter Prover by Means of a*



Wrinkle No. 12.



Wrinkle No. 2.

it overflows, at the temperature of air in the room, and water in prover, and they must be kept same throughout test.

"Pump water from lower tank into top tank until it overflows.

"Open stopcock at bottom of bottle and fill to the lower mark on glass gauge of bottle.

"Test connections between prover and bottle, and be sure they are tight before proceeding with calibration.

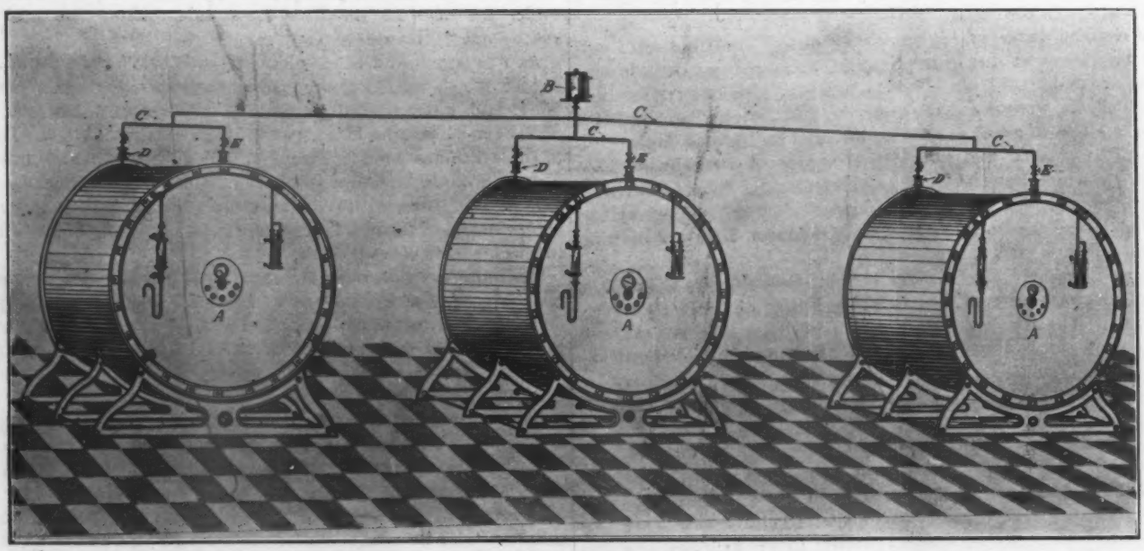
"Mark a starting line on scale at either top or bottom of bell, set pointer on prover exactly on marked line.

"Open stopcock at bottom of bottle and fill with the water from top tank to gauge mark at top of bottle, causing the air in bottle to be forced into prover.

"Mark the scale at point where prover stops.

"Your bottle now being full of water, you can verify the test to be sure it is correct by opening stopcock between bottle and bottom tank, and draw the water from bottle back to lower gauge on bottle again, and the operation will draw the air back from the prover into bottle again lowering the prover back to starting line.

"Pump the water from lower tank back to top tank again. Set prover at the line of second cubic foot and repeat the operation to end of scale, which will either be a 2, 5 or 10 foot prover.



Wrinkle No. 1.

Standard Cubic Foot Bottle.—Place cubic foot bottle in a room suitable to maintain a constant pressure.

"Set up meter prover level by the side of cubic foot bottle.

"The prover bell must be perfectly balanced, either by a cycloidal counterpoise or by other means at all depths of immersion.

"Fill lower water tank of cubic foot bottle with distilled water until

"The marks on scale should be graduated into cubic feet and decimal subdivisions of a cubic foot.

"*A*, represents cubic foot bottle; *B*, meter prover; *C*, water gauges on cubic foot bottle; *D*, 3-way cock; *E*, water tanks on bottles; *F*, water pump; *G*, hose connections connecting bottle to prover; *H*, prover bell or measuring tank of prover; *I*, brass scale to be graduated into

cubic feet and subdivisions of a cubic foot; *J*, water tank of prover; *K*, pointer at scale.

"These standard cubic feet bottles are of copper and are checked by the Government Bureau of Standards, Washington, D. C."—J. O. JONES, Laclede Gas Light Company, St. Louis.

Discussion.

The President—Gentlemen, I hope you will discuss these Wrinkles, making any inquiries that occur to you. It is a very large list for which reason Mr. Baehr requested that he be allowed to read by title only. I sincerely trust that that will not cut off any discussion. We want to hear from all who are interested.

Mr. McAdam—In Milwaukee we have the "Progress Club," a promoters' club, but we have not yet got a "Wrinkle Club." I hope that when we do get one we won't use it for advertising Milwaukee.

Mr. Doty—I would like to ask Mr. McAdam if he will be generous enough to use the "Wrinkle Club" in Milwaukee to advertise the Western Gas Association.

The President—Possibly Mr. Baehr found it cheaper to get his wrinkles in St. Louis than to use the postage necessary to stir up the members of the Western Gas Association.

The Secretary—I will state, Mr. President, that Mr. Baehr used something like $40 worth of postage stamps, and if the members of the Western Gas Association did not respond it is only more to his credit that he himself secured the wrinkles from St. Louis.

Mr. Doty—Mr. President, in addition I may say that, through the generosity of our friends, the AMERICAN GAS LIGHT JOURNAL, we had a standing advertisement for nearly a year, inviting contributions to the Wrinkle Department of the Western Gas Association. Thanks are due the JOURNAL for their generosity in this regard.

Mr. Waring—I think Mr. Baehr's letter rather frightened a number of the members of the Gas Association with the high class expected in the wrinkles; I know it did me. I was afraid that I could not give a wrinkle with him to set the pace for me.

The President—Gentlemen, I hope we won't turn this into a discussion of apology and explanation, but that we will get down to the wrinkles and find something to talk about there. If there is no further discussion on these wrinkles, we will give Mr. Baehr an opportunity to explain why the Laclede stamp is on most of them.

Mr. Baehr—I question whether the Laclede stamp is taken in the sense that it is intended. My intention in asking contributions to the Wrinkle Department was to write only one circular letter, and that is all I did write. Of course, I sent that to as many people as I could reach. I don't think that it is wise for the Editor of a wrinkle department to attempt to keep after a man too hard, and I certainly did not do that. I, therefore, had to avail myself of all sorts of wrinkles where I could get them. In connection with Mr. Waring's remarks, that possibly that circular letter scared somebody out of contributing, I will say I am very sorry at that interpretation, because the intention certainly was not to do it. I would have been very glad to have received any contributions, irrespective of the grade, and the only reason that I put in the question of grade at all was because, as I stated in my prologue, it is very hard to find a sufficient supply of wrinkles of those simple devices which have been put in heretofore. I think the wrinkle work could be improved very much, if everybody would make an effort to contribute along the lines I suggested. Of course, I am not inviting re-election. Thank you.

Mr. Doty—Before Mr. Baehr takes his seat I would like to have the pleasure of moving a vote of thanks to the Editor of the Wrinkle Department, and inasmuch as he had this experience of this year, and knows the work can be improved, I should like to nominate Mr. Baehr as Editor of the Wrinkle Department for another year.

The President—That will be taken care of at the time we elect officers.

[The motion to thank Mr. Baehr was seconded.]

The President—Gentlemen, it has been moved and seconded that the thanks of the Association be conferred upon Mr. Baehr for his able work as Editor of the Wrinkle Department. I believe in putting this motion, I am right in saying that on reading these wrinkles over you will find a very valuable lot of contributions and things that are original and unique. [Motion adopted.]

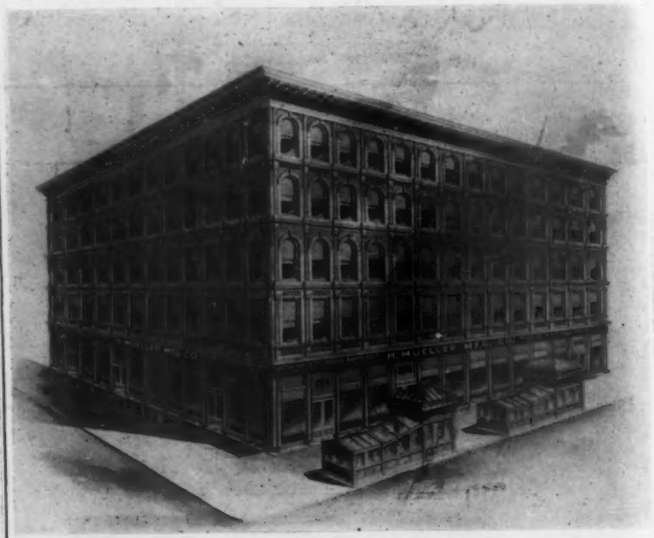
(To be Continued.)

THE Gas Machinery Company, of Cleveland, O., has been awarded the contract for the construction of the coal gas works to be erected at Linton, Ind.

The H. Mueller Manufacturing Company's Eastern Headquarters.

After preparation covering a period of several months, the H. Mueller Manufacturing Company has formally opened its Eastern Division in the commodious quarters at Nos. 254 to 256 Canal street, corner of Elm street, New York city, and is now extending invitations to its friends in the gas, water and plumbing trades to visit its sumptuous new business place.

The accompanying engraving shows the building which the Company occupies to be one of the handsomest in the business district of New York. That its location is particularly fortunate from a business point of view is assured by the fact that Canal street, upon which it fronts, is one of the principal streets extending east and west through the city, and Broadway, extending north and south, only a block away, is one of the most noted business thoroughfares of the world. Elm street, under which is located the great subway, and which passes the building on the east side, is one of the principal streets leading to the Brooklyn Bridge. The building has a frontage of 61 feet on Canal street and a depth of 63 feet on Elm street. The space occupied by the Company includes the ground floor and basement, the later extending under the sidewalk on either street side, making the total available space some 10,000 square feet.



As was announced at the close of the World's Fair, the magnificent exhibit which the Company had at the exposition was moved to New York, and under the supervision of its experts it has been installed with even surpassing cleverness in its new Eastern house. The interior of the office has been furnished in an expensive manner to match the elegant antique furniture and beveled plate glass showcases used at the exhibit, and these, with rich tapestries and tasteful minor furnishings, comprise one of the handsomest and most luxurious office suites of any in similar lines of trade in the East.

The office has entrances both on Canal and Elm streets, and besides convenience of access has every facility for ventilation and light. For artificial illumination it is supplied with eight clusters of incandescent lamps mounted on carved pedestals which are high enough to diffuse light to every part of the room. In the matter of business accessories the office is supplied with messenger service, a private telephone plant, commodious filing apparatus, and in fact devices of whatever nature will expedite the handling of the most business in the least time. With respect to the convenience of the occupants, the office is divided into three compartments, the one nearest the street being used for a sample or showroom, the next for the geueral clerical force and stenographers, and the rear room for the manager, his assistants, etc.

In the showroom are displayed samples of goods which are carried in stock. These comprise water main tapping machines, pressure regulators, brass water connections, lead goosenecks, curb and corporation stopcocks, service boxes, service clamps, strainers and pipe line tools for water works use, gas main tapping machines, gas cocks, gas meter connections and gas relief valves for the use of gas plants, and hundreds of samples of ground key, compression and fuller work and tools for plumbers' use.

At the rear of the office on the ground floor, and occupying the whole of the basement, are the large stock and shipping rooms. The former are fitted with storage bins 6 feet high by 4 feet wide, and divided through the center with heavy wire screening. This is a new feature in the construction of stock bins, the object being to attain a more perfect system of lighting and ventilation than is customary in the installation of work of this kind. The shipping room on the ground floor has an entrance on the Elm street side for the convenience of city deliveries. Both the shipping and stock rooms are connected with the office by private telephone, are arranged so as to give the employees an airy workroom and have every modern facility for saving labor and assisting in the executing of orders on time.

The personnel of the new branch house includes one of the members of the firm and one of its ablest and best known traveling men. Mr. Oscar Mueller, the Treasurer, and the youngest of the six sons comprising the firm, is the Resident Manager. Although a young man in point of years, Mr. Mueller has had a business training that has fully equipped him for this important post. After finishing a course in mechanical engineering at the University of Illinois, he entered the drafting department of the works of the Company, at Decatur, Ills. From this position he was promoted to other and more important places in the shops and offices, being, in 1903, the factory business manager. In that year the Company began making preparations for the exhibit at the World's Fair and, on account of the wide grasp of business which his varied responsibilities had given him, he was selected to represent the firm at the exposition. As was expected of him in this exacting and responsible position, he proved courteous, affable, careful and resourceful, and his managerial abilities have been fittingly recognized in his selection to shape the destinies of his Company's first branch house. His friends, and they are many, expect him to do in his new place as he has done in all of his old ones—to keep on growing until bigger and better things are provided for him.

Mr "Tom" F. Leary, for years the representative of the Company in the Central West, is the Assistant Manager, Mr. Leary was selected for his position on account of his exceptional ability as a salesman and his disposition to always make his talents count. He has many friends on the road and in the water, gas and plumbing trades, who will be pleased to learn that his firm has provided handsomely for him.

The territory covered by the new division comprises that east of the western line of Pennsylvania and north of the southern line of Virginia. Included in it are the following salesmen, with headquarters: Charles Tillinghast, New York city; W. D. Malane, 20 Lincoln Place, Brooklyn; C. T. Ford, 1408 Pennsylvania avenue, Washington, D. C.; W. L. Dickel, Young's Hotel, Boston, Mass.; W. R. Hughes, 5711 Ripley street, Pittsburgh, Pa; George A. Caldwell, Arlington Hotel, Buffalo, N. Y.; and Howard A. Garrard, New Falmouth Hotel, Portland, Me.

Exaggerating the Value of Inventions.[1]

The independent inventor who works out his idea by himself, and not in the capacity of an employee of a manufacturing establishment, generally fails to see that there is an actual market price on this product of his brain, which is usually a good deal lower than the value which he has set on it in the dreams accompanying its inception. He may exaggerate the commercial value of his invention, or, what is fully as likely, he does not realize its imperfect form from the standpoint of the manufacturer. He does not discriminate between the product of his individual brain as compared to the invention which has been developed under commercial conditions by the expert engineering force of the industrial establishment, with all the usually indispensable assistance of searching experiment and test, and the suggestion of men who while not technically trained have the advantage of long and practical experience.

Inventions may be divided in a general way between those of the individual working alone and those of the group of individuals working amidst most helpful and stimulating influences and environments. Take the development of a certain part of a machine tool in an establishment devoted to the manufacture of machines of its type, an engine lathe, for example. Many brains may assist by suggestion or criticism. On the other hand, the individual who works for the same result must depend entirely upon his own capacity. Not all of his errors are distinguishable to him, no matter how patiently and well he may go over his ground. He lacks the stimulus of suggestion and criticism. The result is that when his idea goes to the manufacturer it is usually found that it must be practically reinvented. The whole idea must be gone over again, with expensive experiments and tests, until all that is left is the general principle. This condition of things operates very materially to lessen the money value of the invention, and accounts for a great many disappointments and much of the bitter complaining that the inventor has been robbed of the fruit of his brain.

The lack of a comprehension of these conditions puts a fictitious value upon patented inventions. One recent case was that of a screw wrench which was offered for sale to a manufacturer. An offer of $2,000 cash was made for the patent. The inventor stood out for $10,000, declining to accept anything less. He went the round of wrench manufacturers and found them interested in his idea but not to the extent of financial investment. The inventor failed to comprehend that the trouble was not with the idea, which was sufficiently meritorious, but with a certain cost of developing it to a commercial basis and with the expense entailed in making a market for a new tool. The $2,000 which had been offered was not too little. The inventor looked upon it as the total cost to the manufacturer who offered it. As a matter of fact, the cost would probably have been in excess of the $10,000 at which the inventor held his patent before a market would finally have been made. The redesigning of the wrench, the making of special tools, the working up of the demand and other items would foot up very rapidly. This inventor still has his patent. There are a great many others like him. Hundreds of useful ideas are thus locked up.

Modern conditions of manufacturing and marketing goods have very materially changed the value of the ordinary useful invention. The cost of the article must be kept within the limits of its class, which cannot be done without capital with which to provide economical methods of production. The inventor can rarely manufacture at a profit, unless he has capital and business acumen, as well as some knowledge of the particular branch of the trade. The invention that will revolutionize a demand is very rare. An improvement is often

1. *Iron Age.*

useful, but it is rarely indispensable, and although having a real value the value may not be sufficient to warrant changing a great line of product until perhaps other improvements may be coupled with it to produce a radical and demand creating-advantage.

The proper method of procedure for the inventor who has an idea for sale is to go into the market and get the best price he can. If in the case of the wrench the inventor had accepted the $2,000 he would have had some money, he would have eased his mind of the rankling sense of unappreciated genius and could have gone to work on some other invention which might yield more because it might find a less crowded niche in the industrial edifice. This is the principle upon which the manufacturer of special machinery builds his prosperity. He may receive an unsolicited order for a machine to accomplish a given work or he may suggest to a manufacturer a machine that would cut the cost of production. The machine may contain wonders of ingenuity, even genuine genius. This is very often true. Such a machine is more valuable than many a device which the inventor believes to be worth many thousands of dollars. Yet it brings the market value, which is pretty certain to be a great deal less than what the class of inventors referred to would regard as robbery. The manufacturer of special machinery is satisfied with a substantial profit. He goes to work on other machines, seeking a profitable total of results instead of harboring the belief that a single idea should make him independently rich.

The inventor may rest assured that if he has discovered an idea so valuable as to be worth a great deal of money those to whom it would be a great trade advantage will not consent to a competitor obtaining it without a struggle. The market value will be a high one. Consequently the rule should hold, with a possible exception now and then, that the inventor's creation has its value, which will be regulated by the demand, and the demand will set the price at pretty nearly what it should be.

Alternating Current Motors in Industrial Service.[1]

By P. D. Ionides.

The industries most generally requiring variable speed motors having a wide range of speed are those connected with the making of paper, printing, dyeing and bleaching. In some cases the speed variation required is so wide and so gradual as to preclude the possibility of using induction motors, and until the recent development of the single phase series motor there was no alternating current apparatus which could meet these requirements. In the majority of cases, however, the requirements of speed variation can be met by the use of induction motors of either the squirrel-cage or slip-ring type. For paper calenders the usual requirements are (1) the dead slow speed for threading in the paper; (2) minimum speed for calendering certain classes of paper; (3) top speed for calendering other classes of paper.

These requirements can be met in the following manner: There is a small auxiliary motor driving the main motor through a worm gear and free wheel clutch, so as to give the required slow speed for threading in. The main motor is wound and connected to a controller of the tramway type, so that the coils of the stator can be grouped to form eight poles, at which the medium speed would be obtained, or four poles, at which the full speed would be obtained. In this particular apparatus the supply is at 25 cycles, and consequently the speeds of the motor are 360 and 720 revolutions per minute, making the usual allowance for slip. The changing from dead slow to half speed and from half speed to full speed is obtained by means of tappings from a pair of auto-transformers and a number of notches on the controller, whereby a gradual increase in voltage is applied to the motor as the controller is moved from notch to notch. This insures an even acceleration, and prevents any tearing of the paper. It would have been equally feasible to have wound the motor with 12 and 8 poles, so as to give three-quarter and full speed, or other combinations. The controller is placed remote from the motors for the convenience of the operator, and all movements are controlled by one handle. The whole apparatus is no more costly than direct-current apparatus to accomplish the same results would have been, and the operation is equally satisfactory.

A modified form of the arrangement just described for paper calenders can be used to great advantage on other classes of work; for example, in the driving of air compressors or hydraulic pumps. In this arrangement the motor is wound for two speeds—*i. e.*, tappings are brought out from the windings so that the coils may be grouped to give full speed and half speed, or full speed and three-quarter speed, as the case may be, and connected to a double throw switch, which when thrown in one direction will give the full speed, and in the other direction will give the half speed. This switch can be controlled either mechanically or electrically to regulate the speed of the motor to suit the demand. This arrangement is as simple, or even simpler, than any direct current device to give corresponding changes in speed. A still simpler form of this speed changing device can be used on squirrel cage motors employed to drive machine tools and punching and shearing machines, where different speeds are required, and in this case the switch, which changes the grouping of the coils in the motor, is simply operated by hand. As an example—a 10-horse power motor used to drive a punching and shearing machine. For very heavy work the motor is required to operate at 75 per cent. of the speed at which lighter work could be done. To meet this requirement, the tappings for the grouping of the coils should be so arranged as to give three-quarter or full speed. If half speed and full speed are required, the tappings could be arranged accordingly. The output of the motor is varied in direct proposition to the change in speed—*i. e.*, a 100-horse power motor at 480 revolutions per minute will give 75-horse power at 360 revolutions per minute and 50-horse power at 240 revolutions per minute; but the efficiency at any of these speeds is as high as it is possible to obtain within a very small percentage. As the power required to drive most machinery varies directly as the speed at which it is driven, the output of the motor corresponds very nicely with what is required of it.

The foregoing examples all deal with classes of work where certain fixed speeds will meet the requirements, and all that is necessary is the gradual acceleration between the fixed speeds, but there are other classes of work where it is necessary for the motors to have a speed variation of perhaps 6 or 8 to 1, with the possibility of being able to run continuously, and with high efficiency, at any intermediate speed. This requirement is principally found in connection with paper making machinery, and in some cases with calico printing, bleaching and dyeing. The only electrical apparatus which can accomplish this result has, until recently, been the shunt wound direct current motor operating on two or more voltages, so as to give the required range of speed. The direct current apparatus for this purpose has always been more or less expensive, and difficult to design. The single-phase series motor offers a method of accomplishing this result which is simpler and more efficient. For this purpose the apparatus will consist of a single-phase motor controlled by an induction regulator, which is a boosting transformer placed in series with the motor. This regulator or transformer raises or lowers the voltage, depending on the relative position of the primary, which is moved in relation to the secondary by means of a worm wheel and worm. Any required voltage from zero to full-line pressure can be applied to the motor, and consequently any required speed can be obtained. The losses in the induction regulators are simply the magnetization and C^2R losses. It will thus be seen that the arrangement is not only very efficient but provides for a range of speed variation in 5 shades which cannot be approached by any continuous current device, unless it be very elaborate and costly. For variable speed work, where contact stopping, reversing and starting again are required, both the squirrel cage motor and the slip ring motor may be used. With the former, the control is effected by applying different voltages to the primary by means of auto-transformers and a controller. For this service the resistance in the secondary should be increased so that the maximum torque is obtained at zero speed. This is accomplished by constructing the end rings, to which the bar windings are bolted, of metal having a higher resistance than that used in the construction of a constant speed squirrel cage motor. The torque of this motor varies as the square of the EMF. applied to the primary. This applies to the torque at all speeds—*i. e.* EMF. = 100 per cent., torque = 100 per cent.; EMF. = 90 per cent., torque = 81 per cent.; EMF. = 80 per cent.; torque = 64 per cent., and so on. By means of the auto-transformers and the controller, any voltage can be applied so as to give the required torque and speed. With the slip ring motor, the control is effected by varying the resistances in the secondary circuit of the motor, and this method of control corresponds to inserting resistances in the armature circuit of a shunt wound motor.

For overhead traveling crane work, the squirrel cage motor possesses some advantages over the slip ring type, in that three wires only need be led to each motor, and if three motors are used on the crane, one wire may be common to all three motors. Again, one set of auto transformers can be used in conjunction with the three controllers for the control of the three motors, provided the capacity of these auto trans-

1. From a paper read before the Glasgow Local Section of the Institution of Electrical Engineers, May 23.

formers is equal to the maximum demand which will be made by the three motors. For operating winches, live rolls and work of this class the slip ring motor is preferable for the reason that, in the first place, the starting currents are not so heavy, and, in the second place, the currents handled by the controller are all in the secondary circuit, and consequently at a low pressure, which results in less burning of the contacts.

Manufacture of Coal Briquettes in Japan.

Engineering says that recent events in the Far East have shown most distinctly that one of the most striking features of all that has been done by the Japanese is the thoroughness with which all their plans are made, and the efficient manner in which all details are carried out. They do not "muddle through," as we have been said to do; they make their arrangements with great deliberation, and carry them out with great completeness, and this applies to small as well as to great undertakings. The present war with Russia has put many of their qualities to a severe test, and they have in every case stood it in a manner which has won the admiration even of their enemies. Their operations, both by land sea, have been characterized, not only by great bravery, but also by the manner in which advantage has been taken of the latest developments of science and of its applications. Their ships of war are, in many respects, models even to the most advanced nations, while their battlefields have not only afforded examples of great bravery and good strategy, but have shown how useful the engineer can be in time of war. Light railways have conveyed troops and materials, telegraphs and telephones have allowed the commander-in-chief to direct operations at a distance of many miles, and the most improved scientific instruments have enabled the Japanese officers to counteract the movements of their opponents. At the present moment the supply of smokeless coal for the Navy is one of the most pressing wants, as the coals of Japan are, for the most part, of a very bituminous nature, and therefore not very suitable for the actual operations of naval war, and it is both very expensive and very difficult to get a supply from England under present conditions. Necessity, however, is always the mother of invention, and the Japanese have set themselves to solve the problems involved. Some time ago the Japanese Admiralty purchased the Omine Mine, in Yamaguchi prefecture, for the purpose of manufacturing coal briquettes for naval use. Chief Engineer Takeda, of the Navy, now reports that the machinery recently imported from England has been placed in position and the other necessary arrangements made, and that it is now possible to carry on the manufacture. A railway has been built, over 10 miles in length, connecting the factory with the Kynshu system, and the total expenses are said to have been 1,060,000 yen. Under normal circumstances the factory will turn out 150,000 tons of briquettes per month, but if work be carried on night and day, the figure may be raised to 250,000 tons. The Navy has hitherto had to rely almost entirely on imported coal, costing at least 20 yen per ton; but the briquettes will cost only 9 yen, so that a very great saving will be effected, to say nothing of the obvious advantage of the country being self-supplying in such a vital matter. It is also claimed that the briquettes give better results for steaming purposes and in the matter of non-fouling than even Cardiff coal, so that this latest development of the Japanese is not only of great value to them, but also of interest to the English coal exporters.

Do Safety Appliances Increase Accidents?

Iron Age says that a writer in an English engineering journal draws the deduction from an increase in the number of reported accidents in industrial establishments that "a man's best chance of immunity rests in his own vigilance, and that is destroyed by hemming him in with artificial protection." In other words, the argument is that the growing use of safety appliances designed to reduce the danger of accidents to the minimum operates in exactly the reverse manner and tends to increase the danger. The theory is based on the statistics of such accidents in Great Britain in the years 1897 and 1904. In 1897 the killed numbered 513 and the injured 35,000. In 1904 the killed numbered 721 and the injured 78,000. The increase was a notable one on the face of the returns, particularly in the number of injured. Yet it seems a pretty severe arraignment of the expensive and determined effort to rid manufacturing employment of its dangers to lay the blame at the door of the means of accomplishing a purpose so laudable.

There must be other and better reasons. Perhaps there is some truth in the argument advanced by the English writer, but if this be true the increased danger from the over-confidence of some careless workmen is as nothing compared to the great gain to the working people as a whole. Probably the aggregate of employees taken into the statistics was greater in 1904 than it was 7 years previously. Perhaps the returns were more complete, including a greater percentage of less serious accidents. Various elements must enter into the comparison of great totals such as these. Probably a very important element is the different manner in which the British workman labors as compared to what he used to do. Undoubtedly more pushing methods are becoming strongly intrenched in British factories and workshops. There is greater concentration in his work, in the effort to procure a greater and more economical production. The old deliberation is being replaced by a greater zeal and haste. Where men work rapidly there is less caution as to risk of accident.

To carry out the line of argument against the safety device, the workman would not be completely careless of his life and limb until the safety device had removed all possible danger. But it does not do this. It simply removes danger wherever it is possible. It is absurd to say that it is an added source of danger to inclose gearing so that coat sleeve or hand cannot be drawn into it. And because this danger is removed the workman does not learn to disregard the dangers of a similar menace which from its nature cannot be protected. There must always be danger where there is machinery. The workman knows it, and it is impressed upon him time and time again by his foreman or superintendent. He is as cautious as his nature will permit. A careless man or woman must run the additional risk attendant upon this mental failing. But it is a lesser danger than in the days when the safety device, now applied in a great many ways, was brought into common use. No one supposes that the railroad employee encounters the same danger to-day that he did before the automatic coupling came into general use, and every factory now has safety appliances quite as important. Greater concentration in the work in hand may cause an increase in the percentage of accidents, but we must doubt if that increase is nearly so great as it would be under like conditions of labor, but with the same absence of safety appliances as existed not a great many years ago, when the only protection of the workman was his natural sense of caution.

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, ENGLAND, June 10th, 1905.

The Institution Meeting.

The meeting of the Institution of Gas Engineers has just been held in London, a week earlier than usual, in order to avoid clashing with the Whitsuntide holiday, and passed off with acceptation to all concerned. It was soon evident that the President, Mr. Daniel Irving, of Bristol, had the whole of the details well in hand, and was going to carry them through as successfully as he controls the supply of gas to the extensive district under his charge. As a past president of district gas associations, and with a long connection in one form or another with literary and scientific societies, he has had the advantage of some experience in arranging and controlling meetings of this sort, which was of great assistance in enabling him to efficiently discharge the duties of the chair. Combined with the technical knowledge gained during several years' experience in superintending a district about 10 miles square, and including 3 large stations, it rendered him, at all times, whether conducting the routine business, addressing the meeting, controlling the discussions, or acting as host in the social part of the proceedings, a master of the situation in every sense. The President is still in the prime of life, and belongs to the younger school of engineers, by which I mean, those who did not enter upon the scene at too early a date to receive the benefits of modern educational facilities. And this may have something to do with the fact that the majority of those who took an important part in the proceedings were men of a similar character, men who are young in a broader sense than that implied by the absence of gray hairs. Sir Geo. Livesey and Mr. H. E. Jones, in this sense, were amongst the youngest of those present, and will remain so if they live to the age of 90. The young man is the one who, irrespective of actual age, can move with the times, and the old man is the one that is stuck in a rut of habit or custom and cannot get out of it. In this sense there are old men of 20 and young men of 70. The papers and discussions ran upon the sound lines of adherence to facts rather than opinions, and of taking things as they are rather than as what one imagines they ought to be. There was a marked absence of anything in the way of the traditions of the elders, and a tendency towards being, what for want of a better term, must be described as up to date. All of which goes to show that the gas engin-

eering profession is keeping pace with the times, and not dropping into a back seat. Another notable feature was the cordial reception afforded to the Council by the body of the members. With regard to the part they have taken in the Earls' Court Exhibition there was nothing but praise. And as much may be said with regard to the rest of the proceedings, so far as the large majority of the rank and file are concerned, seeing there are only 3 members who were not in accord with the action in respect to the report of the departmental committee. Having recently dealt fully with this subject I need not repeat the details, but may say broadly that the position already indicated was that which was accepted by the meeting. Of the small minority two appeared to be worshippers of the 5 cubic feet fetish, and the third was a kind of professional Ishmaelite, who seemed to think that it was an evidence of incapacity to even mention such an antiquated thing as illuminating power. If the Council had formulated a scheme in connection with the photometer, there might be some point in his opposition. But as it is, there is difficulty in showing in what respect their action is 25 years behind the times.

I quite agree that the photometer is to some extent obsolete, but before replacing it with the calorimeter or anything else, we want to know a little more about heating values and flame temperatures, and especially about the manufacture of gas having a given heating value. The average gas engineer can undertake to put 15, 16, or 17-candle gas into his holders, according to instructions. He provides a heap of cannel or an enrichment process, and draws on the same as required. But suppose that he is called upon, under equally stringent penalties, to provide a 600 or a 650 B.T.U. gas. Possibly he has not even seen a calorimeter, but at any rate he has no experience in the manufacturing details that are likely to affect the heating value of his product. He has no calorific cannel or petroleum. Until it has been shown to be possible to regulate heating valves with the same facility that obtains in the care of photometrical values, it would be ill-judged and injudicious to accept regulations based upon heating values or flame temperatures. Gas engineers who have had practical experience under the sulphur clauses and absolute sulphuretted hydrogen tests will not accept such a burden. The awful example has his uses at temperance meetings and in a similar manner the opposition seemed to bring out arguments that are well known to the Council, but not matters of common knowledge.

I have said that the members were unanimous in supporting the Council, but if there was one thing upon which it was possible for them to be more unanimous than any other, that one thing was the recommendation that the Murdoch medal should be presented to the Honorary Secretary of the Institution, Mr. James W. Helps, of Croydon. The immediate motive for this, the greatest honor obtainable in the Institution, was, of course, the very successful issue of the Earls' Court Exhibition. But this was only the culminating point of some 25 years public service as Secretary of an important District Association, of services rendered in connection with amalgamation and affiliation of District Associations to the Institution, at the Glasgow Congress, and innumerable other things. An interesting and significant feature is that the Earls' Court Exhibition represents the commercial end of the industry, whereas all previous recipients of the medal have been notable for scientific or technical services. Mr. Helps has not invented a new gas or a new burner, but he has done work that is quite as important and quite as worthy of honor. As an individual it is not too much to say that he has and is still exercising an immense influence, and has reached a unique position in our professional circles, and there is not a man in the profession who would be greeted with more heartfelt and more unanimous applause than that which was accorded to Mr. James W. Helps when he came forward to receive the Murdoch medal from the hands of the President.

Seven papers were presented to the meeting, exclusive of a lecture on the temperature of flames, by Prof. Arthur Smithells. Two of them were directed to structural engineering, two to questions of research, one to finance, one to parliamentary regulations, and one to incandescent gas lighting. It is remarkable, as evidence of the youthful vigor above instanced, that four of them represent pioneer work, showing that the gas engineer of to-day is quite capable of dealing with improvements, even if they lead him into entirely new ground. Mr. Bond dealt with the subject of pyromters for carbonizing temperatures, Mr. Brown took up the subject of low grade mixed gases, giving an account of experiments undertaken with a view of proving the advantages and disadvantages of adding blue gas to ordinary coal gas, either in the retort or in the hydraulic. This paper may claim to be the longest ever presented to the Institution, as the print of it is comprised of nearly 30 pages, exclusive of very voluminous tables. And Mr. Riley had something to say about the incandescent gas light for railway cars. While Mr. Bond and Mr. Riley were informative rather than combative, the subject selected by Mr. Brown was one upon which opinions prevail that are as diverse as they are strong, and it needs some courage to introduce such a question. Mr. Brown gave a full, detailed account of his results, and led up to one of the best debates that has ever been held at the meetings of the Institution. As a standing record for reference, it is scarcely possible to overrate the value of the work. And the extent of the discussion illustrates the attention that is now being devoted to what has unfortunately been termed "low grade" gas. Some members of the Institution are evidently inclined to take the word "low" in too broad a sense and to regard the suggested reduction of photometrical value as the same thing as adding sand to sugar. If the consumer wants 16-candle gas at 3s. per 1,000, let him have it. But if, as has abundantly been shown, his requirements run more in the direction of a 12-candle gas at a lower price, there is nothing discreditable in laying out to meet the need. There is a marked resentment of the injustice of saddling gas with stringent regulations in connection with quality and purity, while candles, oil and electricity go absolutely untrammeled and are thus placed at at a considerable advantage.

The regulations that applied when gas could be regarded as a monopoly are out of place now and the laws of supply and demand may safely be trusted to protect the interests of the consumer in a far more efficient manner than any board of referees or examiners. Mr. Carpenter, the Engineer of the South Metropolitan Gas Company, submitted a paper dealing with the report of the Departmental Committee, and in connection therewith distributed a reprint of some experiments made for his Company by Messrs. Helma and Rideab, on the vitiation of the atmosphere in ordinary living rooms by the products of combustion of coal gas, having special reference to sulphur compounds. So much nonsense has been talked, by parties interested in other agents, upon this subject, that it is quite time to put the matter on a solid basis of fact. Cuttings from old reports and inquiries, made 50 years ago under very different conditions to those obtaining at present, are largely circulated as representing the state of affairs to-day. And it seems to be nobody's business to repute these disingenious proceedings.

The place selected for the annual excursion was Hastings, where the visitors had the opportunity of inspecting a new works just erected by the Hastings and Saint Leonards Gas Company on the outskirts of the district. Perhaps one of the healthiest features in connedtion with our industry is the number of new stations that are being added to our principal towns. Edinburgh has just completed a large new works at Granton, and it would scarcely be possible to name any important town that has not moved in this direction, showing that the ideas of our predecessors as to the expansion of the business have long since been substantially exceeded. At Hastings the visitors were able to see an excellent example of modern advancement.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES

THAT the wide-awake Vice-President of the Parker-Russell Mining and Manufacturing Company, of St. Louis, and his equally live aides have been "on the road" recently to some advantage, would seem borne out by the fact that some new orders booked comprise the following: Ten arches and benches of 9's, for the Rochester (N. Y.) Railway and Light Company, which equipment includes the straight standpipe system with standpipe cleaner, similar to the Point Breeze gas works plan, at the Point Breeze station of the United Gas Improvement Company, Philadelphia. At Spokane, Wash., Mr. Russell's Company is furnishing 8 arches and benches of recuperator 6's, with 10-foot throughs. The Spokane plant, which is under the engineering direction of Mr. F. H Shelton, is to be arranged for the use of the De Brouwer charging machine, the pusher-discharging apparatus to be of the Shelton type. The Russell folks are also under contract to furnish 50 new arches and benches of 8's, 4 tiers high, for the Cincinnati Gas Light and Coke Company. The arches and benches are to be built on the contractors' own designs for the benches, recuperators and iron work, as is really the case with the Parker-Russell Company's contracts as a whole.

THE annual meeting of the Louisville (Ky.) Gas Company will be held to-day. It is more than likely no change will be made in the present management, especially when one remembers that those in custody of the Company's affairs are running it on a perfectly successful mutualization basis.

THE Johnstown (Pa.) Gas Company has presented to the women of the Civic Club, of Johnstown, an entire equipment for a cooking

school, which is to be established by the "Civic" ladies in Minersville. The presentation includes a gas range that is to be given as a prize as a result of proficiency in the domestic science course of the school.

THE following comes to us from Newark, N. J , under date of June 24: "Justice Dixon filed an opinion this week in the Court of Errors and Appeals yesterday sustaining the Supreme Court in setting aside the judgment for $625 obtained by Clarence W. Hitchcock, of Newark, against the Essex and Hudson Gas Company, whose agent forcibly entered the premises of Mr. Hitchcock at 258 South Eighth street and removed the gas meter in the house. This was done because of failure to pay the gas bills and after admission to the premises by the agent had been refused. The contract with the Company provided that it should have free access to the meter at all reasonable hours, and in discussing the forcible entry, Justice Dixon says:

"'It must be noticed that at a reasonable time the defendant's agent applied to the person in charge of the plaintiff's house for permission to do the very thing authorized by the plaintiff, to have free access to the meter and to remove the same; that such permission being refused, he subsequently, at a reasonable time, exercised the authority thus given, without using any more force than was necessary and without causing in the slightest degree any personal disturbance. Unless the application [for the installation of the meter] sanctioned this conduct it is impossible to ascribe to its terms any effect whatever, and in our judgment it must be deemed sufficient for the purpose stated. Although the premises constituted the plaintiff's dwelling, and the law regards a home as peculiarly inviolate, yet the plaintiff had the same right to authorize the defendant's agent to enter there as if the place had been an open field.'"

THE Directors of the Pawtucket (R. I.) Gas Company have elected the following officers: President, Fred. W. Easton; Secretary and Superintendent, William McGregor; Treasurer, George W. Stiness.

MR. THOMAS H. HINTZE, formerly Superintendent of the Lowell (Mass.) Gas Light Company, has succeeded to the vacancy on the staff of the Syracuse (N. Y.) Lighting Company, occasioned by the death of Mr. John H. Tuffs.

THE Gas Machinery Company, of Cleveland, O., so Mr. J. A. Mayers informs us, has been awarded a contract for the installation of a water gas apparatus, a Roots exhauster, etc., on the works of the Williamsport (Pa) Company.

THE Board of Gas and Electric Light Commissioners has authorized the Newburyport (Mass.) Gas and Electric Light Company to issue $60,000 additional stock at par, the proceeds of 450 shares to cancel a like amount of promissory notes, and the remaining 150 shares for payment of additions made to gas plant subsequent to April 1, 1905. Furthermore, the Board authorized the Company to offer to stockholders 850 shares approved February 13, 1903, at $100 per share rather than $125 as previously ordered. Already $138,000 has been expended by the Company for extensions to its gas and electric light works, and on account has outstanding promissory notes for $132,650. Further additions to the Company's plant already determined upon will cost upwards of $15,000, making the entire expenditure for which stock may be issued nearly $148,000.

MANAGER H. L. RICE is arranging for an extension of the mains of the Western United Gas and Electric Company, from Elgin, Ills., to West Dundee.

AT a meeting of the Directors of the Binghamton (N. Y.) Gas Works, the following preamble and resolutions to the memory of Mr. Charles C. Jackson were adopted:

"*Whereas*, Since our last meeting, death has taken from our midst Charles C. Jackson, an honored member of the Board for more than 6 years. Be it

"*Resolved*, That we enter in our minutes our appreciation of his services as a member of the Board and our regret at his demise.

"*Resolved*, Further, that we express in this way our high esteem for him as a man, our sense of loss to the business community, and to each of us personally as of a valued friend and neighbor, and that suitable notice of our action be communicated to his family with our sympathy."

THE Board of Gas and Electric Light Commissioners has authorized the Fitchburg (Mass,) Gas and Electric Light Company to issue 2,200 shares of new stock (par $50) at $80 per share, the proceeds of the sale to be expended in betterments on the Company's plants.

MR. W. J. JOURDAN has been appointed Inspector of Gas and Meters for the city of Los Angeles, Cal. Mr. Jourdan, who is a graduate of Stanford University, was for 2 years Manager of the San Bernardino (Cal.) Gas and Electric Company, then took service with the Riverside (Cal.) Light and Fuel Company, and later on acted as Manager of the Redlands (Cal.) Gas Company. His last active position was with the associated gas companies of Whittier and Pomona, Cal.

"A. F.," writing from St. Albans, Vt., under date of the 24th ult., incloses the following: "Gas will not be turned into the mains of the Bennington (Vt.) Gas Company until some time in July, owing to a delay on the part of one of the contractors regarding certain deliveries of special apparatus. Many of the Bennington manufacturers of small goods are dickering with the Company over the sensibleness of changing from steam to gas power."

AT a meeting of the Fayetteville (N. C.) Gas and Electric Company the officers elected were: Directors, J. H. Martin, E. J. Hale, O. H. McRae, E. M. Shutz and H. C. Bash; President, J. H. Martin; Secretary and Treasurer, H. C. Bash.

IT is barely possible that Manager Thomas, of the New York and Queens Gas Company, of Flushing, L. I., can see his way clear to extending the main system to Bayside.

MR. WILLIAM H. ALLDRED, for many years Secretary and Treasurer of the Equitable Gas Company, of Pittsburgh, Pa., died at his home in that city the morning of the 16th ult. Deceased was born in Pittsburgh December 25th, 1843, and in that city all of his useful life was spent. He is survived by two brothers and two sisters.

THE business of the Toledo (O.) Vapor and Gas Appliance Company has been acquired by the Clinton-Close Company of the same city. Mr. William Strimpel will manage the consolidated concern.

THE following is from the Bridgeport (Conn.) *Standard* of recent date: "Dr. I. de Ver Warner, President of the Bridgeport Gas Light Company is authority for the statement that on September 1st the price of gas will be reduced to $1.15 per 1,000 cubic feet. The reduction affects large consumers to a greater extent, so that those who use $4,900 worth of gas in a year will get it for 90 cents. Dr. Warner, in an interesting statement of facts, said that Bridgeport would get gas at $1 when the average consumption per day aggregated 1,000,000 feet. The present average is 700,000 feet per day. This gas problem is all a question of consumption, said Dr. Warner. This reduction to small consumers is 10 cents on each 1,000 feet of gas used, while large consumers, of course, get a greater reduction. The Bridgeport Gas Light Company is largely owned out of Bridgeport, but the gentlemen have always been fair to us Bridgeporters and have given us everything that we ask for. This reduction has been under consideration for a considerable period of time. We have been figuring and felt that the increased consumption warranted a reduction. When I took hold of things about 5 years ago, a man had to consume $2,000 worth of gas per quarter to get any reduction at all. I immediately saw that such an arrangement was unfair and brought about a chance so that anyone who used $4,000 worth in a year could get it for less than $1. At that time there were 4,800 gas meters in the city, meaning that number of gas consumers. To-day there are 9,000 consumers. Bridgeport is the smallest consumer of gas of any city of its size in New England. New Haven has 24,000 consumers, Hartford 14,000 and Springfield 12,000 or 14,000. You can't make little gas as cheap as you can a great deal of it. During my connection with the Company it has spent between $200,000 and $300,000 in improvements. The old coal gas plant on Housatonic avenue has been abandoned and is not worth $1. We have a fine plant in the West End and are adding to it all the time. The consumption of gas is increasing. There are a few days in the winter when the aggregate daily consumption is 1,000,000 feet. Of course, in summer it drops off again. You can say that the Company has not paid a cent in dividends since I have been interested in it. The profits have been used in making improvements in our plant. If the local consumption of gas was anything like New Haven or Hartford dollar gas could be furnished without the Company going into bankruptcy. The present leakage of gas is 11 per cent. Five years ago it was 25 per cent. We will supply dollar gas in Bridgeport just as soon as the consumption warrants it and when it reaches the figure mentioned. Those are facts that we are not in the habit of talking about, but I mention them to show that we are fair with our patrons."

THE new selling rate at Dallas, Tex., became effective the 16th ult. It is: Gross, $1.35; net, $1.25 per 1,000. Manager Mockett is busily engaged in extending the main system.

THE AMERICAN GAS LIGHT JOURNAL

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NOTIFICATION RESPECTING ADVERTISING.
Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

AGENTS:
New York—American News Co., 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, JULY 3, 1905.

The Market for Gas Securities.

The market for city gas shares was not marked by anything that would indicate grave changes as to values since last time of chronicling. Mr. Sheffield declined the Presidency of the State Lighting Commission, and his declination seems to have placed the Odell-Higgins combination in a tight box. The declination means much in a political way, and it also shows anew the truth of the old saying, "All's not lost that's in danger." Consolidated closed at 191 to 191½ to day (Friday), and those who are still short are borrowing the stock for deliveries at a fair interest rate. New Amsterdam 5's are 111 to 113.

Brooklyn Union nominally remains unchanged. Peoples, of Chicago, is decidedly on the mend. It is bid 103¾, asked 104¼. Cincinnati Gas and Electric is again commanding attention, but it looks to us that all rumors concerning change of control in the Company are not well founded. Lacledes are fairly to the mark, and Columbus (O.) common at 90 seems a purchase.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

JULY 3.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	Capital.	Par.	Bid.	*Asked.*
Consolidated	$73,177,000	100	191	191½
Central Union, Bonds, 5's.	4,000,000	1,000	108½	110
Equitable Bonds, 6's	1,000,000	1,000	..	103
" 1st Con. 5's	2,300,000	1,000	118	120
Mutual	3,500,000	100	300	320
Municipal Bonds	750,000	..	..	..
New Amsterdam Gas Co. ..				
Bonds, 5's	11,000,000	1,000	111	113
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	35	
1st Mtg Gold Bds. 5 p. ct.	1,000,000	..	..	
Northern Union, Bonds, 5's.	1,250,000	1,000	104	106
New York and East River..				
Bonds 1st 5's	3,500,000	1,000	112	114
" 1st Con. 5's	1,500,000	..	106½	108½
Standard	5,000,000	100	125	130
Preferred	5,000,000	100	145	155
Bonds, 1st Mortgage, 5's	1,500,000	1,000	116	117
Yonkers	299,650	500	130	..
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	188	194
" " Bonds (5's)	15 000,000	1,000	113	115
Bay State	50,000,000	50	¼	⅜
" ncome Bonds	2,000,000	1,000	..	75
Binghamton Gas Works..	450,000	100	..	65
" 1st Mtg. 5's	509,000	1,000	93	96
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	6	7
" " Bonds, 5's	5,250,000	1,000	66	68½
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Cincinnati Gas and Electric Co	29,500,000	100	107	107½
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	97½	99
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	..	95
Preferred	3,036,500	100	107½	103
Consumers, Toronto	,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	83	..
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's.	1,000,000	..	..	..
Equitable, 1st 6's.	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
" Con. Mtg. 5's	880,000	1,000	89½	92
Bonds	75,000	..	..	100
Detroit City Gas Co	4,825,500	50	..	50
" Prior Lien 5's	5,608,000	1,000	..	98
Detroit Gas Co., 5's	981,000	1,000	75	80
" Inc. 5's	16,000	100	98½	100
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	39	40
Fort Wayne	2,000,000	..	..	..
" Bonds	2,000,000	..	35	..
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	..	104½	105½
" Bonds, 5's	10,500,000	..	107	108
Indianapolis	2,000,000	..	70	75
" Bonds, 6's	2,650,000	..	106½	108
Jackson Gas Co	250,000	50	82	..
" 1st Mtg. 5's	200,000	1,000	101	102½
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	86
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	..	..
Preferred	2,500,000	100	98	100
Bonds	10,000,000	1,000	108½	109
Lafayette Gas Co., Ind.	1,000,000	100	..	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas & Elec. Co.				
" 1st Mtg. 6's	350,000	1,000	107½	108½
" 6 per cent. scrip, due 1910	100,000	25	85	87
Montreal, Canada	2,000,000	100	218	218¾
Nashville Gas Lt. Co.	1,000,000	100	110	..
Newark, N. J., Con. Gas Co.	6,000,000	..	56	58
Bonds, 6's	4,000,000	..	105	105¾
New Haven	2,000,000	25	200	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	103¾	104¼
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	..
Rochester Gas & Elec. Co..	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	15,800,000	100	58¼	58¾
St. Joseph Gas Co.				
" 1st Mtg. 5's	751,000	1,000	94	96
St. Paul Gas Light Co	1,500,000	100	45	47
1st Mortgage 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's..	2,465,000	1,000	92	93
Syracuse, N. Y.	1,975,000	100	50	55
Bonds	2,047 000	1,000	102	..
Washington, D. C	2,600,000	20	198¾	200
First mortgage 6's	600,000	..	..	..
Western, Milwaukee	4,000,000	..	..	..
Wilmington, Del.	600.000	50	200	..

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DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO.,
N. W. CORNER BROAD AND ARCH STS.,
PHILADELPHIA, PA., June 14, 1905.

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable July 15th, 1905, to stockholders of record at the close of business, June 30, 1905. Checks will be mailed.

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(Signed) HORACE McKAY,
Chairman Finance Committee.

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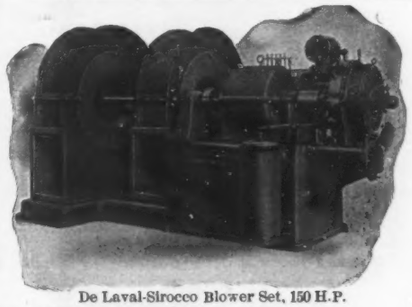

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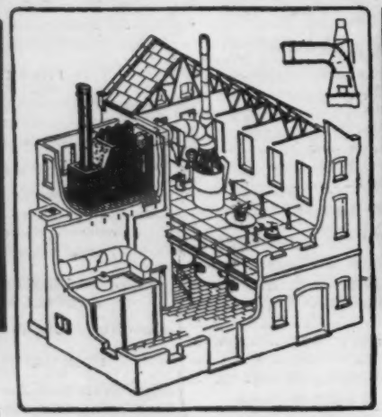

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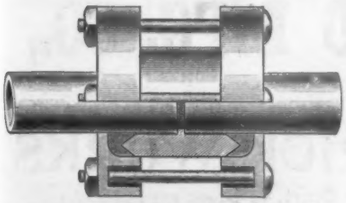
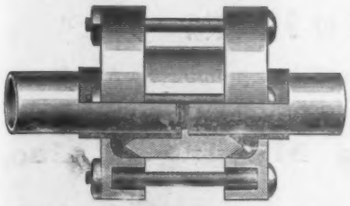
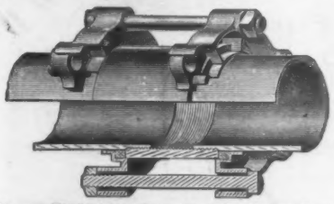


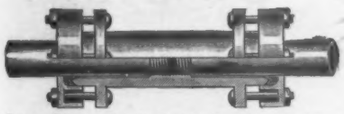
Regular Coupling, Style 1, for Plain End Wrought Iron Pipe.



Insulating Coupling, Style 5, for Plain End Wrought Iron Pipe,



Clamp, Style 4, for Repairing Leaks on Screw Collar.



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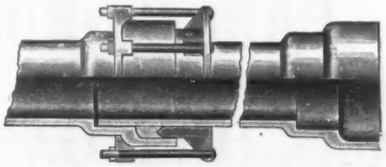
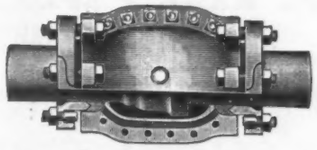
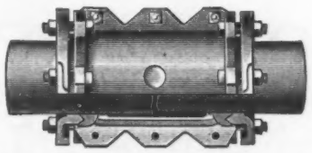


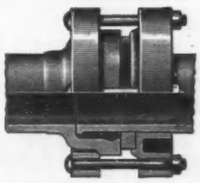
Coupling, Style 9, for Special Style Cast Iron Pipe.



Split Sleeve for Repairing Broken Bell on Cast Iron Pipe.



Split Sleeve for Repairing Broken or Cracked Cast Iron Pipe.



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Half and Full Depth Benches of Our Own Design, Containing 6, 8 or 9 Retorts.

SLOPERS.--We have perfected plans of INCLINED RETORT BENCHES, designed to meet conditions prevailing in America, and constructed entirely of American materials.

We Build Benches Complete. Ready for Gas Making. Also,

RETORT HOUSES,

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Plans, Specifications and Estimates Cheerfully Furnished.

CORRESPONDENCE SOLICITED.

ALL CONTRACTS MADE AS OF ST. LOUIS, MO.

Gold Medals awarded by the Louisiana Purchase Exposition at St. Louis, for fireclay gas retorts, gas retort benches, firebrick and setting tiles.

HARBISON-WALKER REFRACTORIES COMPANY,

Farmers Bank Building, Pittsburg, Pa.

REPRESENTING

HARBISON-WALKER CO.
PHILIPSBURG FIREBRICK CO.
CLEARFIELD FIREBRICK CO.
BASIC BRICK COMPANY,
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MANUFACTURERS OF

HIGH GRADE FIREBRICK

For Gas Plant Construction,

Chrome, Magnesia, and Silica Brick,

Ground Fireclay, Silica Cement, Dead Burned Magnesia and Chrome Ore.

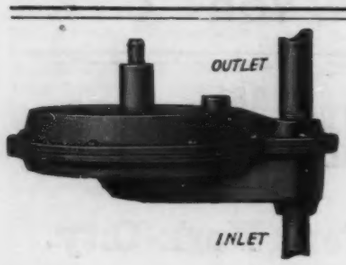
We Carry in stock constantly at our various works a complete line of shapes in the following well-known brands:

BENEZET,	CLEARFIELD,	MUNRO	"W. F. B."
WOODLAND,	WIGTON STEEL,	EUREKA,	CORNING.
H. & W. SPECIAL,	WALLACE,	TYRONE,	CLINTON.

For use in every line of work in which refractory Material is required.

Catalogues will be furnished upon application. : - - Correspondence and trial orders solicited.

(In writing, kindly mention this Journal.)



REYNOLDS HIGH PRESSURE GAS GOVERNORS.

Our Governors Reduce 30 or 40 Pounds Pressure to 2 Inches Water Pressure.

WE MAKE ALL SIZES OF

DOUBLE DISTRICT GOVERNORS, INDIVIDUAL HOUSE SERVICE AND LOW PRESSURE GOVERNORS.

Write for Catalogue and State what you Need.

JOHNSON-REYNOLDS CO.,

ANDERSON, IND., U. S. A.

IN most cities there are possibilities for considerable profitable

Outdoor Lighting

during the summer months. Any gas company can get a good share of this business with the aid of the

Humphrey Outdoor Lamp.

To those who have not looked into the proposition the large amount of money paid over to the electric companies for this class of service will prove surprising.

GENERAL GAS LIGHT CO.,
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NEW YORK: 46 West Broadway.
SAN FRANCISCO: 530 Market St.

The "Air-Light"

Premier Burner Of America.

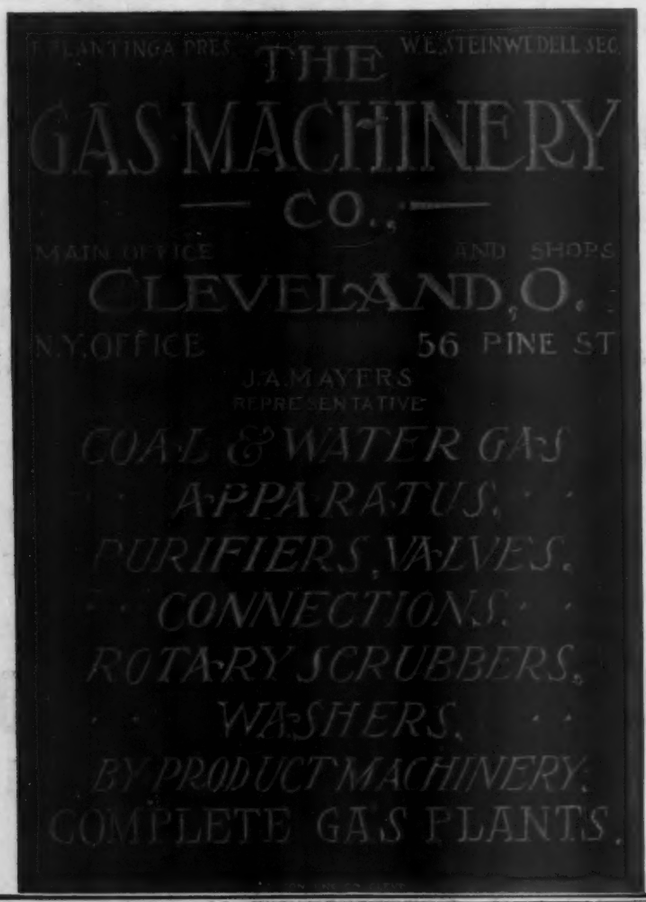
GENUINE "AIR-LIGHTS,"
A NEW BURNER FOR 1905.
AGENTS WANTED EVERYWHERE.
Increased in Value. Decreased in Price.
A High-Class Burner, a Rapid Seller, and a Money Maker for Agents, Dealers, Gas Companies, etc.

DENAYROUZE TRADE MARK AIR-LIGHT REGISTERED PAT. 673,705 MAY 7 1901

CENTRAL LIGHTING CO., 86 Warren Street, New York, N. Y.

Write or Call for Prices and Particulars.

THE AMERICAN STANDARD COMPOSITION CO.
—MANUFACTURES—
HEAT PROOF AND DAMP PROOF PAINTS
For Structural Iron and Steel, Gas Apparatus, Underground Piping, Boiler Fronts, Stacks, etc.
Our Paints will not crack, peel or scale. Heat does not affect them. They are moisture proof.
They are the Paints that Don't Come Off!
We let you Try before you Buy. Send for samples and prices.
AMERICAN STANDARD COMPOSITION COMPANY,
1707, Wall Street Exchange Building, New York.



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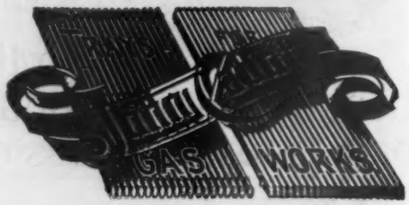
1448-tf

Church's Patent Trays.

Reversible; Strongest; Most Easily Repaired.

Special Trays for Iron Sponge.



1412-1416 Adams Street, Hoboken, N. J.

We also Supply the Chapest and Strongest

•Reversible Bolted Trays•

IN THE MARKET.

SEND FOR BOOKLET AND CIRCULARS.

Telpherage

Is the electrically operated, or trolley, system of transporting materials of whatever nature or size. Where no other method is possible, Telpherage overcomes the difficulty. It conveys over streets, driveways, railroad tracks, rivers, valleys, alongside precipitous cliffs or mountains, on straight lines or curves, or on any degree of incline. It brings into close communication the several departments of industrial establishments, and for relieving a freight-congested yard, depot, wharf or warehouse, is the best method in existence. We invite questions.

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Dodge Coal Storage Company.

PHILADELPHIA: Nicetown. NEW YORK: 49 Dey St. PITTSBURGH: 1501-1502 Park Bldg. BOSTON: 164 Federal St. PORTLAND, ORE.: 309 McKay Bldg.

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PRESSURE GAUGE.

For continuous records of **Street Gas Pressure.**

Simple in construction, accurate in operation and low in price.

Fully Guaranteed. Send for Circulars.

THE BRISTOL CO.,

Waterbury, Conn.

Gold Medal, St. Louis Exposition.

THE BEST are THE CHEAPEST.

HOMOGENEOUS CONSTRUCTION ~ PERFECT FINISH ~ LONGEST CONTINUOUS LIFE.

WE HAVE RETORTS MAKING GAS TO-DAY THAT HAVE BEEN IN CONSTANT USE FOR 52 MONTHS.

Awarded the Only **GRAND PRIZES** At St. Louis Exposition

BY A JURY COMPOSED OF THE MOST COMPETENT ENGINEERS OF FOUR CONTINENTS, FOR SUPERIOR

RETORTS * GAS BENCHES * FIREBRICK.

Designs and Estimates Cheerfully Furnished.

LACLEDE FIREBRICK MANUFACTURING COMPANY,

ST. LOUIS, MO.

You can buy burners
that cost less than

BRAY BURNERS,

But all you save on the first cost will be lost a hundred times over in the increased number of complaints and dissatisfied consumers.

DON'T PUT GOOD GAS IN THE HOLDER AND SPOIL IT AT THE BURNER.

BRAY BURNERS

Have been used by the largest Gas Companies for over forty years, because

THE PROGRESSIVE GAS MAN ONLY WANTS THE BEST.

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NEW YORK,

Have you a Bray Blue Book? SOLE AGENTS FOR THE UNITED STATES.

THE

Ludlow Valve Mfg. Co.,

TROY, N. Y., U. S. A.

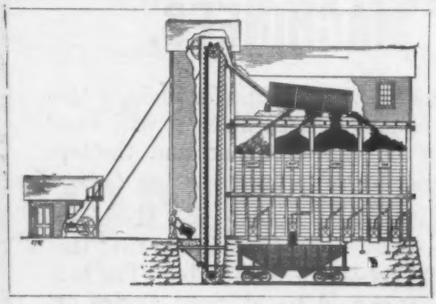
Double and Single Gate Valves, ¼" to 72",

—FOR—

Gas, Water, Steam, Oil, Ammonia, Etc.

HOT GAS VALVES A SPECIALTY.

Send for Catalogue.



Coke-Crushing and Screening Plant,

Erected in 1903 for Keystone Coal and Coke Co., Greensburg, Pa.

The machinery consists of 2-roll Crusher, 46'6" centers Continuous Bucket Conveyor, and 4' 6" dia. × 18' long Revolving Screen The coke pocket is 33' × 21' × 24' high, and is equipped with gates and chutes for chuting coke to cars.

Write for Link-Belt Coal-Handling literature.

LINK-BELT ENGINEERING COMPANY,
Philadelphia.

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COAL TUBS.

Self-Dumping and Self-Righting coal tubs with extra large wheels. Six sizes kept in stock for prompt delivery.

C. W. Hunt Company,
BODINE STREET, WEST NEW BRIGHTON, N. Y.

The Gas Engineer's Pocket-Book,

By HENRY O'CONNOR.

Comprising Tables, Notes and Memoranda relating to the Manufacture, Distribution and Use of Coal Gas, and the Construction of Gas Works.

PRICE, $3.50.

For Sale by

A. M. CALLENDER & CO., 42 Pine Street, New York City.

COAL TAR
—AND—
AMMONIA.

Third and Enlarged Edition.

BY
GEORGE LUNGE, Ph.D.

Price, $15. For Sale by
A. M. CALLENDER & CO.,
42 Pine Street, New York City.

FINANCES OF
Gas and Electricity Manufacturing Enterprises,
By WM. D. MARKS. Price, $1. For Sale by
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EMPIRE GAS IMPROVEMENT AND CONSTRUCTION CO.

This Company has purchased the patents and goodwill in the business hitherto carried on and owned by *A. M. Sutherland.* It is now ready to contract for the erection and installation of

ENTIRE GAS WORKS,

or any separate portion of the same, such as **Gasholders, Coal Gas Benches, Lowe-Sutherland** double-superheater **Water Gas Sets,** Scrubbers, Condensers, Exhausters, Purifying Boxes, Street Governors, Street Mains and Main Laying.

The high character of the work done by A. M. Sutherland during the past 15 years will be strictly adhered to and all work is warranted.

Mr. Sutherland remains with the Company for two years President and Director, and will give personal attention to contracts.

EMPIRE GAS IMPROVEMENT AND CONSTRUCTION CO., 49 Wall St., New York.

IMMERSION WASHERS.

A design embodying particularly desirable features.

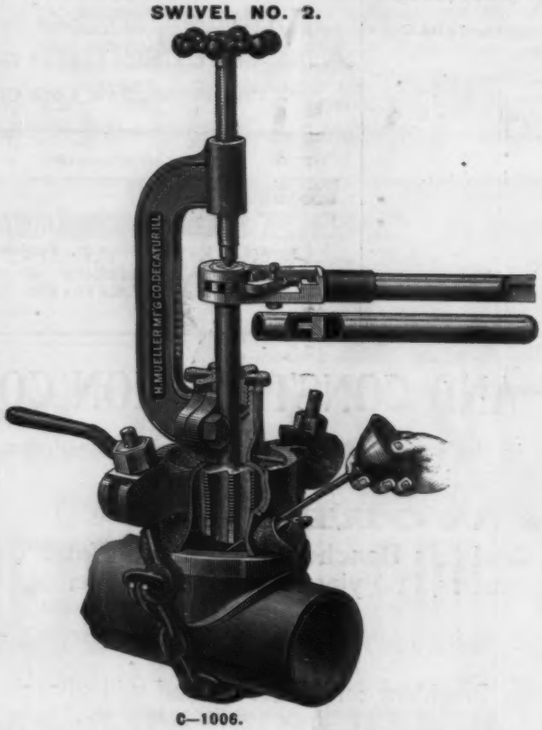
LLOYD CONSTRUCTION COMPANY,

Western Sales Agents for
BARTLETT, HAYWARD & CO., Baltimore, Md.

DETROIT, MICH.

MUELLER GAS MAIN TAPPING MACHINEES.

SWIVEL NO. 2.



C—1006.

If a tapping machine hasn't facilities for making the tension of the chain equal on both sides, it will lean toward the side having the tighter tension and the tap will not be perpendicular to the pipe.

The chains on Mueller Gas Main Tapping Machines have a chain nut at each side of the machine so that the tension can be made the same on each side. The tap can always be made as it should be, at right angles or perpendicular to the pipe.

Mueller Gas Main Tapping Machines are made in seven different styles for different classes of work, and make taps for ⅝ to 3-inch in any size of pipe. The machine illustrated is Mueller Swivel No. 2, which makes taps from ⅝ to 3 inch in pipes from 4 inches to the largest.

Each machine is carefully inspected and assembled, is given a working test as near like actual service as possible, bears the Mueller trade mark, and is *unconditionally guaranteed.*

We also make meter connections and ground key work for gas works use. Catalogues upon application.

EASTERN DIVISION—Located at 254-258 Canal Street (cor. Elm), New York City, carries a full stock of Mueller goods.

THREE GRAND PRIZES were awarded Mueller Water, Gas and Plumbing goods, respectively, at St. Louis.

H. MUELLER MFG. CO.,

DECATUR, ILL., U. S. A.

NEW YORK, N. Y., U. S. A.

ROOTS' GAS EXHAUSTERS.

GOLD MEDAL AT ST. LOUIS, 1904.

Installation showing our latest improved machines, with flexible rope coupling, for large units.

SEND FOR CATALOGUE.

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1547 Marquette Building.

ARTHUR E. BOARDMAN, C.E.,

For several years associated with the late
CAPTAIN WILLIAM HENRY WHITE,
WILL CONTINUE THE BUSINESS OF

CONSULTING ENGINEER

For Gas, Water and Electric Light Companies, at
No. 41 Wall Street, Room 1707, New York.
TELEPHONE, 5534 BROAD.

FRANK D. MOSES,

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Constructing Engineer and Contractor.

Estimates Furnished on any kind of Work in Connection with Gas or Water Plants.
SPECIAL ATTENTION GIVEN TO THE REMODELLING AND EXTENDING OF THE PROPERTIES OF WORKS NOT UP-TO-DATE.
CORRESPONDENCE SOLICITED.

GEORGE ORMROD, Mangr. & Treas., Emaus, Pa.
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EMAUS PIPE FOUNDRY.

DONALDSON IRON COMPANY. EMAUS, PA.

MANUFACTURERS OF

CAST IRON PIPE AND SPECIAL CASTINGS

FOR WATER AND GAS.

Also, FLANGE PIPE, LAMP POSTS, Etc.

GAS TAPPING MACHINES

—FOR—

Drilling and Tapping Pipe under Pressure

WITHOUT ANY ESCAPE OF GAS.

They are Strong and Compact.

Size of Combination Drills and Taps ¾ to 4-inch.

Machines Sent to any Gas Company for Thirty Days' Trial.

Send for Circulars.

Geo. Light,
DAYTON, O.

MUELLER
DRY PIPE TAPPING MACHINE.

C—1008.

Mueller Dry Pipe Tapping Machines, including the Mueller "Regular," "Our Special" and "Our Special No. 2," comprise a line unequal for their class of work. They are made strong, are easily attached to the pipe, and are easy to operate under all conditions of use. All dry pipe machines make taps from ¾ to 3-inch in any size of pipe. Unconditionally guaranteed Catalogues upon application.

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Globe Street and Boulevard Lamps.
Cheapest and Best
THOUSANDS IN USE WITH INCANDESCENT BURNERS.
Send for Catalogues.
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GASHOLDER TANKS AND GAS WORKS MASONRY COMPLETE.

Plans prepared and Estimates furnished at short notice.

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Established 1856. Works at Phillipsburgh, N. J.

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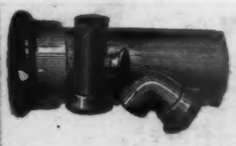


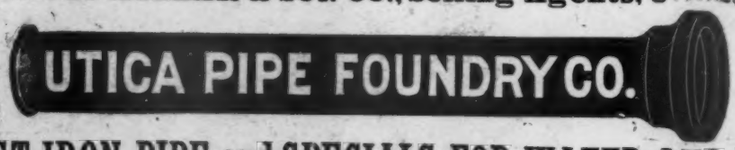
CAST IRON WATER AND GAS PIPE,

FROM THREE TO FORTY-EIGHT INCHES DIAMETER. ALSO, ALL SIZES OF

Flange Pipe for Sugar House and Mine Work. Branches, Bends, Retorts, etc., etc.

CHARLES MILLAR & SON CO., Selling Agents, Utica, N.Y.

Flanged Pipe and Fittings, Hydrants, Gates, Pig Lead, Jute, &c.



Manufacturers of Lead Pipe, Solder, etc., and Jobbers of Plumbers' and Tinners' Goods.

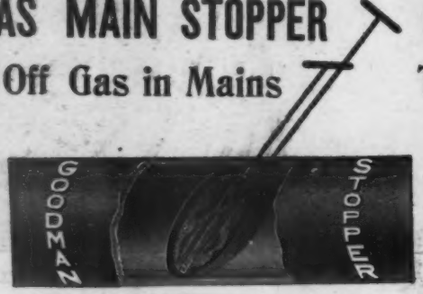
CAST IRON PIPE and SPECIALS FOR WATER AND GAS.

Wholesale Eastern Agents AKRON VITRIFIED SEWER PIPE.

SAFETY GAS MAIN STOPPER COMPANY,

For Shutting Off Gas in Mains

Any size gas main can be shut off in 30 seconds. : : :



Temporarily during alterations and repairs. : : : :

STOPPERS SENT ON TRIAL.

Address: SAFETY GAS MAIN STOPPER CO., 1668 Park Ave., New York City.

This is No. 2.

Height, 36 inches.
Diameter, 12 "
Shipping weight, 80 lbs.
Net weight, 50 lbs.
The products of combustion are entirely separate from the water. Entire water surfaces are tinned.

Price, $35.00.

HOT WATER

FOR BATHROOM AND KITCHEN

is most easily, quickly and economically supplied by a

Humphrey Crescent Instantaneous Water Heater.

Prices range from $20 to $45.
Every Heater GUARANTEED.

Set a heater for every gas consumer. You will please them and increase sale of gas at the same time.

Send to-day for catalogue and discounts to

HUMPHREY CO.,
Kalamazoo, Mich.,

The only manufacturers in the World of a COMPLETE LINE OF INSTANTANEOUS WATER HEATERS.

GEORGE R. ROWLAND,
Formerly with the Continental Iron Works.
Draughtsman and Constructing Engineer.
Drawings, Specifications and Estimates furnished for the construction of new works or alteration of old works. Special attention given to Patent Office drawings.
Office, No. 245 Broadway, N. Y. City.

J. F. W. JOST,
CHEMICAL ENGINEER
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GAS MANUFACTURE,
P. O. BOX 2643, PHILADELPHIA, PA.

AMERICAN METER CO.,

NEW YORK, ST. LOUIS, PHILADELPHIA, SAN FRANCISCO, CHICAGO,

Photometrical and Experimental Apparatus.

PUBLIC LIGHTING TABLE.

JULY, 1905.

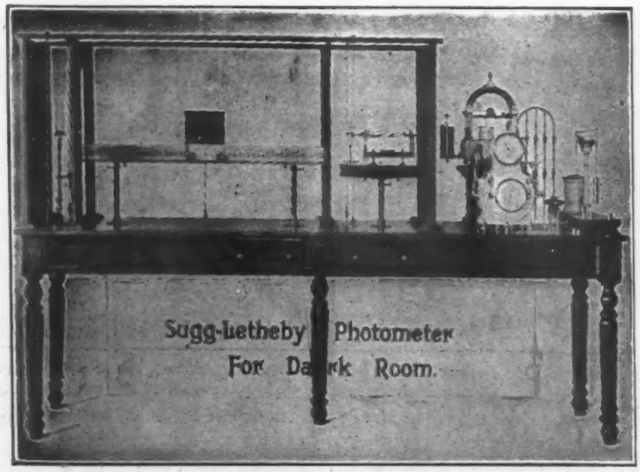
Table No. 1.
FOLLOWING THE MOON.

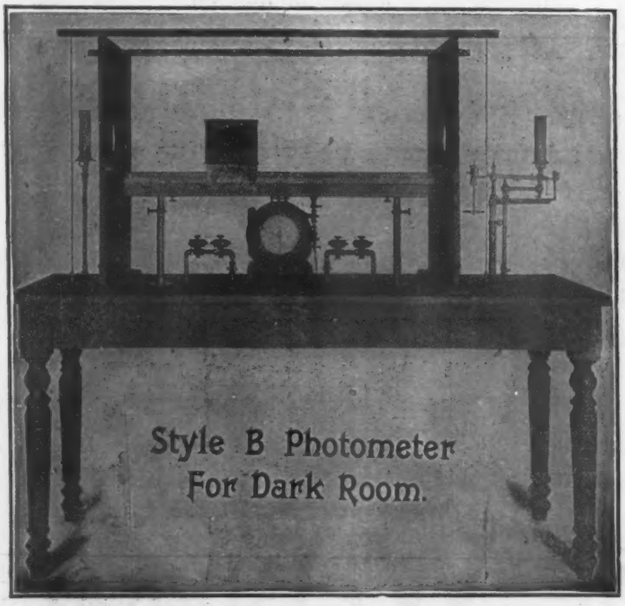
Day of Week.	Date.	Light.	Extinguish.
Sat.	1	8.00 PM	3.30 AM
Sun.	2	8.00 NM	3.40
Mon.	3	8.00	3.40
Tue.	4	8.00	3.40
Wed.	5	8.00	3.40
Thu.	6	8 00	3.40
Fri.	7	9.50	3.40
Sat.	8	10.30	3.40
Sun	9	11.00 FQ	3.40
Mon.	10	11.40	3.40
Tue.	11	12.20 AM	3.40
Wed.	12	1.00	3.40
Thu.	13	1.50	3.40
Fri.	14	2.50	3.40
Sat.	15	No L.	No L.
Sun.	16	No L. PM	No L.
Mon.	17	No L.	No L.
Tue.	18	8.00 PM	9.50 PM
Wed.	19	8.00	10.20
Thu.	20	8.00	10.50
Fri.	21	8.00	11.20
Sat.	22	8.00	11.50
Sun.	23	7.50	12.20 AM
Mon.	24	7.50 LQ	12.50
Tue.	25	7.50	1.20
Wed.	26	7.50	2.00
Thu.	27	7.50	2.40
Fri.	28	7.50	3.50
Sat.	29	7.50	3.50
Sun.	30	7.40	4.00
Mon.	31	7.40 NM	4.00

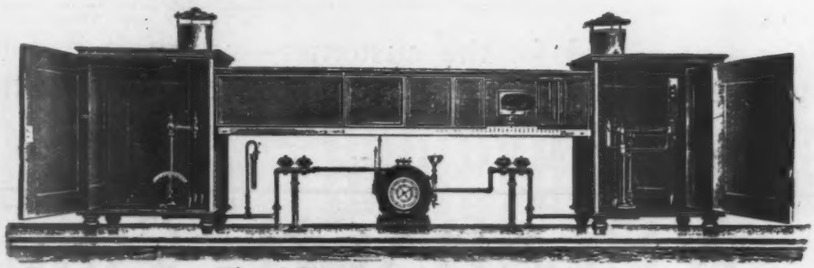
TOTAL HOURS DURING 1905.

By Table No. 1.

	Hrs.Min.
January	240.50
February	192.20
March	207.00
April	175.10
May	161.00
June	139.50
July	149.00
August	161.50
September	173.00
October	205.00
November	211.00
December	229.00
Total, yr.	2245.00







Closed Photometer For Light Room.

CIRCULARS SENT ON REQUEST.

PUBLIC LIGHTING TABLE.

JULY, 1905.

Table No. 2.
NEW YORK CITY.
ALL NIGHT LIGHTING.

Day of Week.	Date.	Light.	Extinguish.
		P.M.	A.M.
Sat.	1	7.30	3.15
Sun.	2	7.30	3.15
Mon.	3	7.30	3.15
Tue.	4	7.30	3.15
Wed.	5	7.30	3.15
Thu.	6	7.30	3.15
Fri.	7	7.30	3.15
Sat.	8	7.30	3.15
Sun.	9	7.30	3.15
Mon.	10	7.30	3.15
Tue.	11	7.30	3.15
Wed.	12	7.30	3.15
Thu.	13	7.30	3.15
Fri.	14	7.30	3.15
Sat.	15	7.30	3.15
Sun.	16	7.20	3.15
Mon.	17	7.20	3.15
Tue.	18	7.20	3.15
Wed.	19	7.20	3.15
Thu.	20	7.20	3.15
Fri.	21	7.20	3.15
Sat.	22	7.20	3.15
Sun.	23	7.20	3.15
Mon.	24	7.20	3.15
Tue.	25	7.20	3.15
Wed.	26	7.20	3.15
Thu.	27	7.20	3.15
Fri.	28	7.20	3.15
Sat.	29	7.20	3.15
Sun.	30	7.10	3.30
Mon.	31	7.10	3.30

TOTAL HOURS DURING 1905.

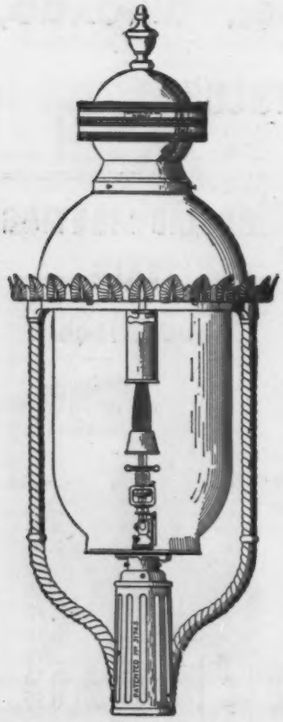
By Table No. 2.

	Hrs.Min.
January	423.20
February	355.25
March	355.35
April	298.50
May	264.50
June	234.25
July	243.45
August	280.25
September	321.15
October	374.30
November	401.40
December	433.45
Total, yr.	3987.45

NEW YORK, 57 Liberty Street. BOSTON, 814 Beacon Building. PHILADELPHIA, Broad and Arch Streets. ST. LOUIS, 712 Roe Building. CHICAGO, Foot of Orleans Street. SAN FRANCISCO, 712 Polk Street.

WELSBACH STREET LIGHTING COMPANY

.... OF AMERICA ....



No. 3c.

Controls and Operates the

Welsbach System of Street Lighting,

Which includes its specially DESIGNED AND PATENTED BURNER for STREET and PARK LIGHTING exclusively.

Uniformly SUCCESSFUL in 150 Cities and Towns.

By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

POINTS OF MERIT:

It is { Economical, Attractive, Successful, Up-to-date.

IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

Correspondence Solicited from Gas Companies and Others interested in Municipal and Outside Lighting.

No. 38.

AN underlying principle in business is to show an increase each year---to grow. The astute dealer not only seeks to retain this year's customers, but to attract new trade next year.

The formula is simple---

THIS SHIELD IS THE WELSBACH TRADE MARK.

IT IS A GUARANTEE AND A PROTECTION.

Sell The Welsbach Brands.

The imitation stuff is bad for the customer---which is bad for you.

The genuine Welsbachs---Burners or Mantles---make satisfied customers---keep customers---MAKE NEW ONES.

And your profit isn't merely dollars and cents.

WELSBACH CO.,

Broad and Arch Sts., PHILADELPHIA.

THE UNITED GAS IMPROVEMENT COMPANY

For the Year Ending December 31st, 1904, has been Awarded Contracts for 45 Sets of

Standard Double-Superheater Lowe Water Gas Apparatus.

PARTIAL LIST OF PLACES:

Harrisburg, Pa.	**New York City** (14th contract).	**Lynn, Mass.** (5th contract).
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Reading, Pa.	**Watertown, N. Y.**	**Battle Creek, Mich.**
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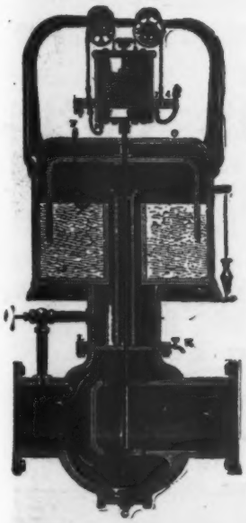

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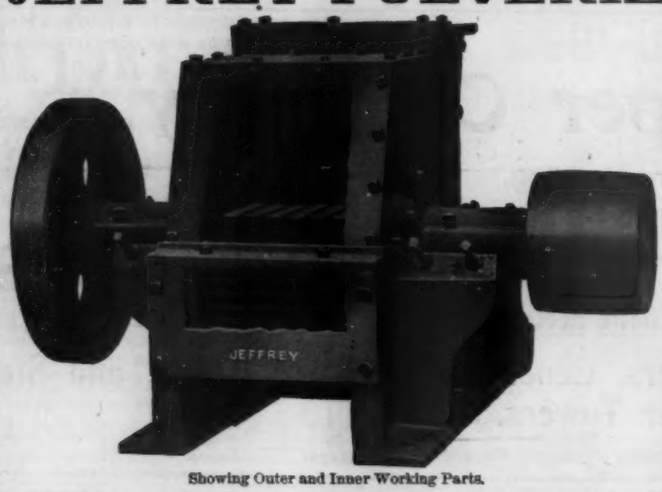

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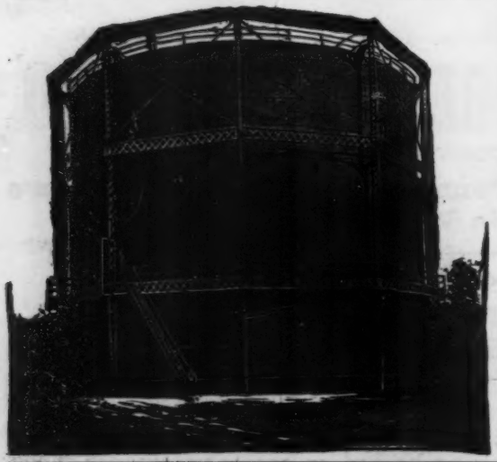

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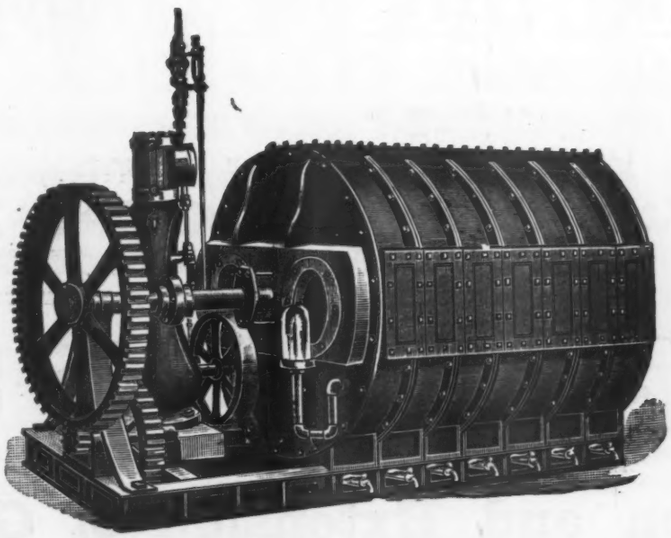

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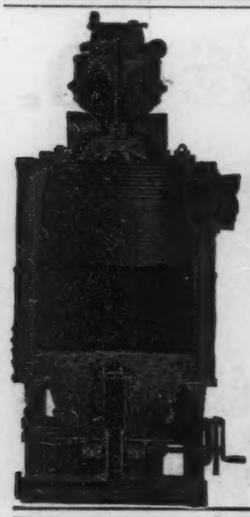

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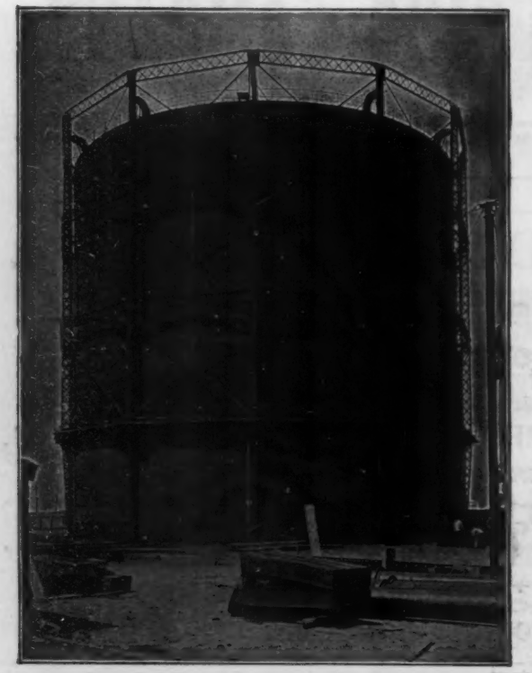

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MR. E. H. YORKE, NEW HAVEN, CONN., Dec. 1, 1898.

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I note that most of these extracts are broad and safe guiding precepts, which apply with equal force to one Company as to another. The 13 years' existence of the Board of Gas Commissioners, with its unusual opportunities for acquiring information, have justly made it a high and safe authority in all matters pertaining to the management, obligations and rights of Gas Companies. Your little book will serve as a valuable reference library in settling legal complications which often arise between a Gas Company and its customers.

Yours truly, (Signed) F. C. SHERMAN, Superintendent.

☞ A 28-page Pamphlet, containing the cream of this Board's decisions as to the proper management of Gas Companies.

Compiled by E. H. YORKE. Price, $1.00. Address,

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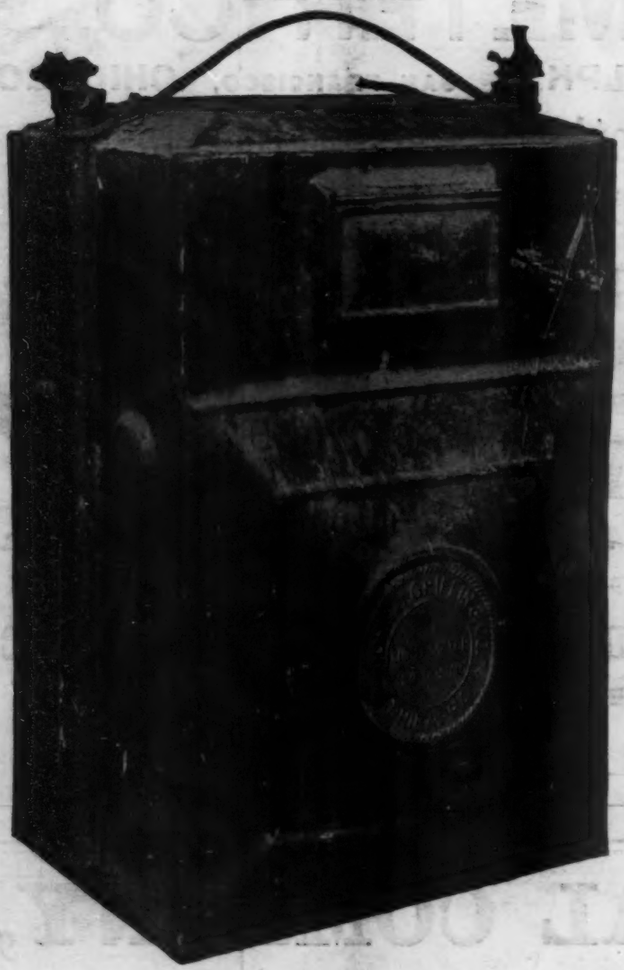
BEFORE.



This is a photograph of a 3-light regular meter out of a lot of meters received from the Coatesville Gas Co., Coatesville, Pa., to be repaired and converted into prepayment meters.

AFTER.

This is the same meter after it has been repaired and converted into a new prepayment meter.

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